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Heavy Minerals and Sedimentary Petrology of Cretaceous Sands from the Shubenacadie Outlier, Nova Scotia

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G. Pe-Piper, R. R. Stea, S. Ingram and D. J. W. Piper

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Heavy Minerals and Sedimentary Petrology of Cretaceous Sands from the Shubenacadie Outlier, Nova Scotia

G. Pe-Piper[1], R. R. Stea[2], S. Ingram[1] and D. J. W. Piper[3]

Abstract

Cretaceous sands from the Shubenacadie outlier were drilled by the Nova Scotia Department of Natural Resources in 1994 and 1995. The petrography of heavy mineral separates has been determined by point counting. Chemical mineralogy of the heavy minerals has been determined by electron microprobe analysis and is compared with potential source rocks in the Meguma and Avalon terranes. Heavy lithic clasts and unusual metalloids have been analyzed. Interpretations of provenance are integrated with new grain size analyses and interpretation of bulk geochemical analyses. The mix of unstable and stable heavy minerals suggests derivation of both first cycle minerals (feldspar, pyroxene, amphibole) and second- or multi-cycle minerals (tourmaline, staurolite, zircon). The second- or multi-cycle source is likely principally Horton Group sandstone, originally derived from the South Mountain Batholith. There is no evidence for direct first-cycle derivation from the batholith. Lithic clasts appear derived from mineral deposits of the northern Meguma terrane and from plutonic rocks of the Avalon terrane.

[1]Department of Geology, Saint Mary's University, Halifax, NS B3H 3C3 gpiper@stmarys.ca
[2]Nova Scotia Department of Natural Resources, PO Box 698, Halifax, NS B3J 2T9
[3]Geological Survey of Canada (Atlantic), Bedford Institute of Oceanography, PO Box 1006, Dartmouth, NS B2Y 4A2

Introduction

The Shubenacadie river valley is located in the Hants-Colchester Lowlands of central Nova Scotia (Fig. 1) and is underlain by Carboniferous rocks composed of evaporites and carbonates interbedded with grey and red clastic sedimentary sequences. This is unconformably overlain by thin Cretaceous clay and sand of the Chaswood Formation, which are overlain by Quaternary deposits ranging in thickness from 13 to 80 m (Stea *et al.*, 1996). The lowland region contains south- and southeast-trending drumlins and moraines of less than 50 m relief. The Cretaceous sediments outcrop only in the Shaw Resources clay pit on West Indian Road.

Stea *et al.* (1996) used 13 drillholes (Fig. 2) to define the margins of the Cretaceous sediments in the Shubenacadie Valley, which they termed the "Shubenacadie outlier", expanding the known extent of the Cretaceous rocks from 0.5 km^2 to about 15 km^2. The same authors have also defined seven unconsolidated lithostratigraphic units from two transects (Figs. 3 and 4 in Stea *et al.*, 1996). This stratigraphy is consistent with the stratigraphy described by Dickie and Murphy (1992) for the West Indian Road Pit (the main Shaw Resources silica sand pit; Fig. 1). They interpreted this Mesozoic basin as a half-graben structure on the basis of the presence of a thick faulted limestone breccia at the base of the SHU95-10 drillhole, and the abrupt lateral pinch-out of Cretaceous rocks.

Objectives and Methods

The purpose of this report is to describe in detail the heavy mineral petrology, chemical mineralogy, major element geochemistry, and grain size distribution of representative sand samples recovered from the drillholes SHU94-1, SHU94-2, SH94-4, and SHU95-1 of Stea *et al.* (1996). Such data will be of value in ultimately determining the regional dispersal patterns and diagenesis of Cretaceous sediment.

All petrological and mineralogical data and observations are from probe polished grain mounts of heavy mineral separations. The sand fraction used for heavy mineral separation was in the size range of 0.5 mm to 0.063 mm, and the heavy liquid used was tetrabromoethane. The probe chemical analyses and the back-scattered electron images (BEI) were made at the regional electron microprobe centre of Dalhousie University. Minerals were analysed with a JEOL-733 electron microprobe having four wavelength spectrometers and a Tracor Northern 145 eV energy-dispersion detector. The beam was operated at 15 kV and 15 nA, with a beam diameter of 10-20 μm. Mineral name abbreviations follow Kretz (1983).

Grain size analyses were performed using 18 sieves ranging from 4 mm to 0.0012 mm. The cumulative curves and statistics reported were done using the computer program "GRADISTAT" version 4.0 (Blott and Pye, 2001).

Whole-rock geochemical analyses used in this report were reported by Stea *et al.* (1996). They were carried out on separated sand and <2 μm fractions, rather than on bulk rocks.

Results

For the heavy liquid mineral separation the 0.5 to 0.063 mm fraction was used and in this way the "heavy minerals" counted contained many lithic clasts. The clasts were then studied using both microscope and

probe mineral chemical analyses. Thus, we managed to better define the types of rocks that produced these sands. Both heavy and some light minerals (e.g. muscovite) have been analyzed by electron microprobe. In the point-counting traverses the spacing between the horizontal lines was 1 mm, and the spacing between vertical lines was 0.5 mm.

We point counted polished mineral mounts from 20 representative samples: 4 samples from SHU94-1, 1 from SHU94-2, and 15 from SHU95-1 (Table 1). The percentage of "heavy minerals" in the studied samples ranged from 0.14 to 4.22%, with only two samples, SHU95-1-11 and SHU94-1-14, containing more "heavy minerals" (Table 1). The components of the polished mineral mounts have been grouped into: individual opaque minerals, individual translucent minerals, metalloids and lithic clasts, with a number of members in each group (Table 1). The changes in these four groups (opaques, metalloids, translucents and lithics) with depth for the SHU95-1 drillhole are shown in Figure 4a.

Translucent stable silicate minerals that have been identified include: tourmaline, staurolite (Fig. 5), andalusite, topaz, garnet, titanite, and zircon (Table 3). The translucent unstable silicate minerals identified include: pyroxene, amphibole, biotite, feldspar, chlorite and epidote. The relative abundance ranges of the most common of these minerals are as follows:

Tourmaline:	7-58%
Staurolite:	6-60%
Zircon	0-15%
Garnet	0-8%
Andalusite	0-4%
Topaz	0-4%
Unstable	0-81% (pyroxene, amphibole, biotite, plagioclase, epidote)

The abundances of all these minerals are also plotted in Figure 4.

Non-silicate translucent minerals identified include apatite (Table 4), an unknown aluminum phosphate (Table 4) and carbonates (calcite and dolomite) (Table 4).

Opaque minerals identified include Fe-Ti oxides, Fe-hydroxides, and sulphides. The Fe-Ti oxides include ilmenite (e.g. Figs. 6A, 7, 8a, 9a, 10), which is by far the most abundant detrital mineral and is often altered to rutile, together with rutile, magnetite and Ti-magnetite (commonly with ilmenite exsolution) (Fig. 11a), hematite and goethite (Table 5). The most common Fe-hydroxide is limonite (Fig. 11b). The sulphides identified include pyrite, chalcopyrite and sphalerite (Table 6).

Lithic clasts are abundant and include the following general groups:

1. felsic igneous rocks (Figs. 6b, 7, 8a, 8b, 9, 12, 13);
2. mafic and intermediate igneous rocks (Figs. 14, 15);
3. volcanic rocks (Fig. 16)
4. metalloids (Figs. 17, 18, 19, 20); and
5. mineralized and non-mineralized sedimentary rocks (Figs. 21, 22, 23, 24).

Variability in mineral assemblages is illustrated in Figures 25 and 26.

Discussion

Heavy Mineral Assemblage and Stratigraphic Distribution

The overall abundance of heavy minerals (including heavy lithic clasts) in the 2-4 ϕ fraction shows a systematic increase in finer grained sediment (Fig. 27) and is generally between 0.2% and 1% of the total sediment.

Plots of heavy mineral distribution within the lower member of the Chaswood Formation in borehole SHU95-1 (Fig. 4) show the following characteristics.

(1) Relative abundance of different components does not vary systematically with modal grain size.

(2) In general, translucent minerals become more abundant stratigraphically upward and lithic clasts become less abundant. Opaque minerals and metalloids show no systematic stratigraphic distribution.

(3) Tourmaline and staurolite are the most abundant translucent heavy minerals. Both of these minerals are transport-resistant minerals and, therefore, their occurrence and abundance may indicate second-cycle or multicycle origin.

(4) The unstable minerals (feldspar, pyroxene, amphibole, biotite, epidote) are also common, which on the contrary indicates that there was not long transport before the deposition of these minerals, in other words they probably have a relatively local origin.

(5) There is usually an inverse correlation between tourmaline + staurolite and the unstable translucent minerals.

Information on provenance may also be obtained from the chemistry and the inclusions of certain heavy minerals. Such minerals may include: opaque oxides (ilmenite, magnetite, titanomagnetite), garnet, muscovite, tourmaline and staurolite. Our findings are outlined below:

Opaque Oxides

Schneiderman (1995) has successfully used the detrital opaque oxides as provenance indicators. Ilmenite, both fresh and altered to rutile and pseudorutile, is the most common Fe-Ti oxide in studied sands (Fig. 28), although magnetite and titanomagnetite are also present (Table 5). Schneiderman (1995) has found TiO_2, Al_2O_3, Cr_2O_3, MgO, ZnO and V_2O_3 more useful than MnO in discriminating the sources for the Nile river sediments; however, we have found that MgO and MnO can discriminate between ilmenites from early Mesozoic basalt/diabase, Avalon terrane plutons, and Meguma terrane plutons (Figs. 29, 30). Most ilmenite from the Shubenacadie sands resembles the Avalon terrane plutons. The presence of magnetite and especially titanomagnetite (e.g. Fig. 11) also supports such a provenance. Some ilmenites have higher Mn contents suggesting a metasedimentary source.

The type of inclusions in ilmenite may also be of some significance. The most common inclusions in the analysed ilmenites is quartz. The morphology of such inclusions indicates that these inclusions are the results of melt crystallization (e.g. Fig. 9) and thus these ilmenite crystals come from igneous felsic rocks. In contrast, ilmenite in metasedimentary rocks of the Meguma Group, and quartz veins cutting these rocks, contain anhedral quartz inclusions (A. K. Chatterjee, personal communication, 2001). The association of the ilmenite crystals with quartz crystals (e.g. Figs. 6b, 8, 9) is also consistent with an igneous origin.

Other inclusions in ilmenite crystals may include muscovite and tourmaline (e.g. Fig. 9) which indicate peraluminous felsic rock as source; or zircon, rutile and apatite (e.g. Fig. 8) which may indicate metaluminous felsic rock as source and in particular granodiorites. This suggestion is also supported by the fact that such ilmenites have been found in contact with hornblende or plagioclase crystals. In a few samples a crude alignment of quartz inclusions (e.g. Fig. 10) is more suggestive of hydrothermal veins than metamorphic origin.

Garnet

The garnets from the studied sands chemically fall in two groups (Fig. 31). When compared with potential regional sources, one group is similar to magmatic garnet reported from the South Mountain Batholith by Allan and Clarke (1981) and thus igneous rocks must be the potential source for it. The second group has higher Mn and Mg contents than analyzed garnet from Meguma Group metasediment, with the exception of garnets from the Rawdon Meguma Group metasediments (Tables 3 and 9). A metamorphic rock source is thus suggested for the second group of garnet grains.

Tourmaline

Henry and Guidotti (1985) have suggested a number of fields of tourmaline compositions dependant on their source (Fig. 32). About 40% of the tourmaline from the Shubenacadie sands falls in the Li-poor granitoid field. These granitoid rocks probably were the sources for the Carboniferous sandstones, which in their turn provided detritus for the Cretaceous sands. The remaining tourmaline from the Shubenacadie sands falls in the metapelite - psammite field (i.e. clastic metasediments).

Muscovite

Miller *et al.* (1981) have suggested two fields for muscovite chemical compositions: one for primary and one for secondary muscovite, although later authors (e.g. Ham and Kontak, 1988) have found exceptions. Petrography is more reliable for discriminating primary from secondary muscovite; however, sharp crystal outlines often may not have been preserved in detrital muscovites. The analyzed muscovites from the studied sands all fall within the field for primary muscovites of Miller *et al.* (1981) (Fig. 33). These same muscovites are generally less sodic than those of the South Mountain Batholith, but rather similar in Ti-Mg-Na composition to primary muscovites from the eastern Meguma Terrane plutons (Tables 3 and 9).

Staurolite

Staurolite in the Shubenacadie sands shows typical metamorphic textures with aligned quartz inclusions (e.g. Fig. 5).

Types of Lithic Clasts

Figure 4a indicates that the lithic clasts are abundant along the whole stratigraphic section of the Shubenacadie outlier. The identified rock types include the following.

Felsic igneous rocks (granite and rhyolite)

The identification of these rock types is based mostly on the characteristics of ilmenite such as: the association of ilmenite and quartz (Figs. 6b, 8a, 8b, 9, 12, 13), and quartz inclusions in ilmenite (Fig. 9). Judging from the type of mineral inclusions in the ilmenite, some of these felsic igneous rocks are of peraluminous chemical composition (common muscovite inclusions) and others metaluminous (only quartz, or zircon or apatite, or a combination of these minerals).

Mafic and intermediate igneous rocks (diorite and granodiorite)

The identification of these rock types is based on: (a) mineral association of individual clasts and in particular the presence of hornblende, biotite and plagioclase (e.g. Figs. 14, 15, 16); (b) texture of clasts (Figs. 14a, 15); (c) properties of individual mineral grains (e.g. hornblende crystals with andesine inclusions; Fig. 26: analyses g and h); (d) alteration of individual crystals e.g. alteration of plagioclase to epidote (Fig. 14); and (e) the presence of individual mineral grains such as orthopyroxene, clinopyroxene, and hornblende.

Mineralized and non-mineralized sedimentary rocks (sandstone)

The identification of this rock type is again based on texture and mineral association (Figs. 21, 22, 23, 24). Identified minerals include mainly quartz, Fe-Ti oxides, Fe hydroxides, sulphides such as pyrite, and more rarely chalcopyrite, sphalerite, muscovite, and tourmaline. Carbonate minerals are not often present in such clasts; however, both calcite and dolomite have been identified more often either as independent crystals or concretions or overgrowths on limonite clasts or in contact with igneous clasts. Sphalerite identified in mineralized clasts (Fig. 21a), but also the sphalerite found as independent crystals, is poor in Fe and as such it is similar to sphalerite of the Smithfield, Brookfield, Gays River and Walton mines (Meguma Terrane) and not to Fe-rich sphalerite from the Sterling deposits (Avalon Terrane).

Clasts of metalloids

Smith and Mackay (1993) have reported clasts of metalloids or metal alloys from highly altered gold-bearing Meguma Group rocks at Brookfield, Queens County. The identified metalloid types in the Shubenacadie sands include: Cu-W alloy (most common) (Figs. 17b, 18, 20a), Ag, Zn+Ag (Fig. 19b), Cu+Zn or Cu+Fe (Fig. 20a) and probably some sulphides of the same elements (Fig. 16, Table 8).

There are also clasts of native iron. Figure 17a shows such a clast that contains native iron intimately intermixed with quartz and magnetite, and the grain includes chlorite (?pseudomorphing olivine or pyroxene). The texture appears volcanic. Another grain consists of native iron with a rim of limonite and then an outer layer of calcite.

Geochemistry

The chemical analyses used in this study (Table 11) come from both mud and sand. The 2 to 0.063 mm fraction of sand and the <2 μm fraction for clay were analysed (Stea *et al.*, 1996). The sand fraction and the clay fraction do not come from same samples, thus limiting the extent to which bulk geochemistry can be interpreted. The geochemical highlights are listed below.

1. Sand samples are invariably rich in SiO_2 and generally deficient in TiO_2, Al_2O_3, MgO and Fe_2O_3 (as total iron) compared with clay (Fig. 34).

2. The relative abundances of Al_2O_3, CaO, Na_2O and K_2O (Fig. 35) indicate different trends for the sand and clay, although both move towards kaolinite, which is the weathering product of feldspars. Muscovite also seems to be an important chemical component of the clay. A plot of compositions on an Al_2O_3 - $CaO+Na_2O+K_2O$ - FeO_t + MgO ternary diagram (Fig. 36) is also consistent with typical chemical weathering of feldspars, primarily to kaolinite. The chemical variation shown in Figures 35 and 36, and the petrographic studies, indicate that muscovite is probably detrital from the source region. The trend shown by the studied sands (Figs. 35, 36), when compared with those from Nesbitt *et al.* (1996) for the derivation of sandstones from a granitic bedrock, are not very similar. This combined with our petrographic observations agrees with the suggestion that the source area was not granitic bedrock. For the most part, the Shubenacadie outlier geochemical data look very similar to the data for the Horton Group metasedimentary rocks, and especially to those from the Barren Hills Formation in the St. Marys Basin (Murphy, 2000), with the exception of $Al_2O_3/CaO+Na_2O$ versus Fe_2O_3+MgO. Both sand and clay fractions plot outside the fields for Meguma metasedimentary rocks (MMS) and Meguma granitoid plutons (MP) of Murphy (2000) in several diagrams (Figs. 34 and 37). Using the discrimination diagrams of Bhatia (1983) the Shubenacadie sands plot in the passive margin field (Fig. 37, a and b).

Summary of Provenance Information

Heavy minerals and geochemical data from the Cretaceous Shubenacadie outlier indicate several sources of sediment. Heavy lithic clasts appear derived from mineral deposits of the northern Meguma Terrane and from plutonic rocks of the Avalon Terrane. The mix of unstable and stable heavy minerals suggests derivation of both first-cycle minerals (feldspar, pyroxene, amphibole) and second- or multi-cycle minerals (tourmaline, staurolite, zircon). The second- or multi-cycle source at the nearby West Indian Road pit was identified as likely Horton Group sandstone by Gobeil (2002), on the basis of pebble petrography and muscovite geochronology. The Horton Group rocks were originally derived from the South Mountain Batholith and Meguma Group, and the chemical composition of some garnet, muscovite and tourmaline at Shubenacadie is consistent with such a source. Bulk geochemistry of sand from Shubenacadie resembles that of the Horton Group. Garnet and tourmaline characteristic of metapelitic sources might have been derived from the Meguma Group, or from metamorphic rocks farther inboard in the Appalachians, or may be second- or multi-cycle. Although staurolite is found in at the western and eastern extremities of the Meguma Group outcrop, it is not a common component of Horton Group sandstones in central Nova Scotia (Gobeil, 2002). Our unpublished data show that it is a common mineral in the Chaswood Formation at Vinegar Hill, N.B. (Falcon-Lang *et al.*, 2004), and it may, therefore, have an origin in the Miramichi Highlands or other inboard parts of the Applachian orogen. Unstable first cycle minerals resemble those found in plutonic rock fragments and are, therefore, probably derived from the Avalon Terrane. The first-cycle ilmenite and its alteration products can also be matched with the Avalon Terrane and the characteristic chemistry and texture of ilmenite derived from the Meguma Terrane is lacking.

Grain Size of Sands

Grain size analyses of representative samples are shown in Figures 38-41. Beds of clay contain 2-5% very fine sand and most silty clay beds contain 20-30% sand. Lignite beds are also reported to contain

significant sand. Thus, the presence of sand throughout the fine facies in all the boreholes is a striking feature of the sediments and suggests that the area was close to an active river.

Silica sand beds show a wide range of modal sizes, from 3 mm to 75 μm. Fine to medium sand commonly has a coarse tail of granules. Many well-sorted sands (e.g. most of those in SHU95-1-1) have 1-8% mud fraction, with >5% mud only in medium to fine sand. Very fine sand may contain up to 30% mud. One poorly sorted pebbly sand (95-1-10) contained 21% mud, perhaps because mud intraclasts were analyzed. The reasonably systematic relationship between modal size and percentage mud suggests that the mud content is a primary feature and not a result of circulation and trapping of muddy drilling water. It is possible, however, that some mud was introduced to the sands by pedogenic or diagenetic processes. Plotting of grain size as a probability function (Fig. 42) shows components with a log-normal (Gaussian) grain size distribution as straight lines, with their gradient proportional to sorting. Samples in which the clay component is considerably better sorted than the silt component (e.g. Fig. 42a) may have been enriched in clays by pedogenic or diagenetic processes. Where silt and clay show similar sorting (e.g. Fig. 42c, d), it is more likely that this fine-grained component was trapped at the time of deposition, as demonstrated in grain size curves from outcrops in the West Indian Road pit by Gobeil (2002).

Conclusions

Petrographic and geochemical data from the Shubenacadie Cretaceous outlier indicate several sources of sediment. The mix of unstable and stable heavy minerals suggests derivation of both first-cycle minerals (feldspar, pyroxene, amphibole) and second- or multi-cycle minerals (tourmaline, staurolite, zircon). The second- or multi-cycle source is likely principally Horton Group sandstone, originally derived from the South Mountain Batholith. There is no evidence for direct first-cycle derivation from the batholith. Lithic clasts appear derived from mineral deposits of the northern Meguma Terrane and from plutonic rocks of the Avalon Terrane.

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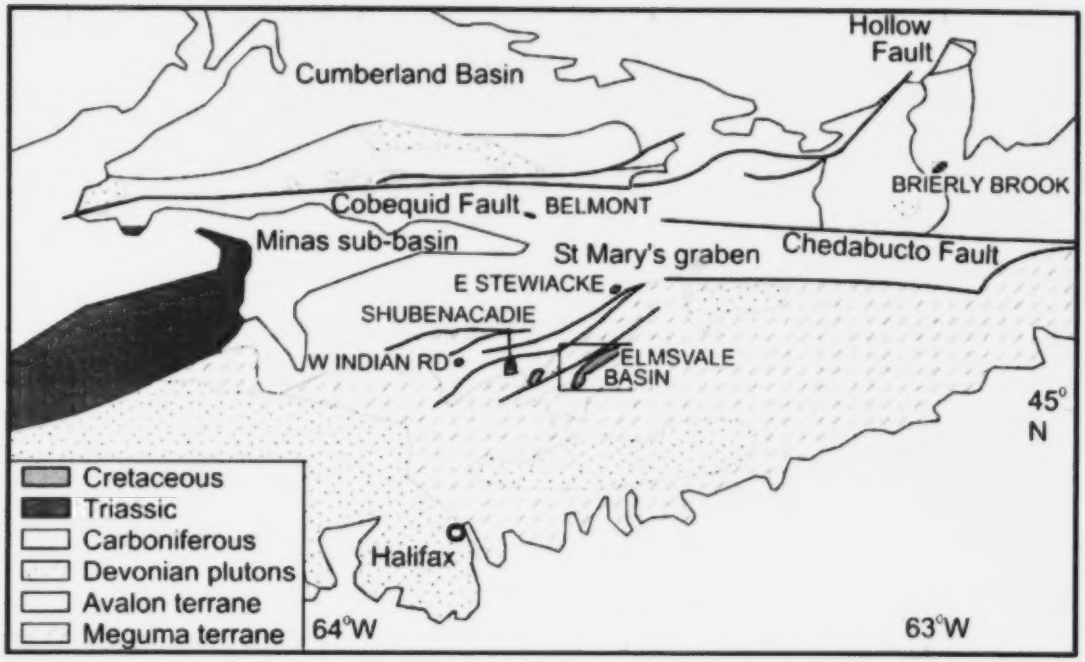


Figure 1. General map of central Nova Scotia showing location of the Shubenacadie Cretaceous rocks.

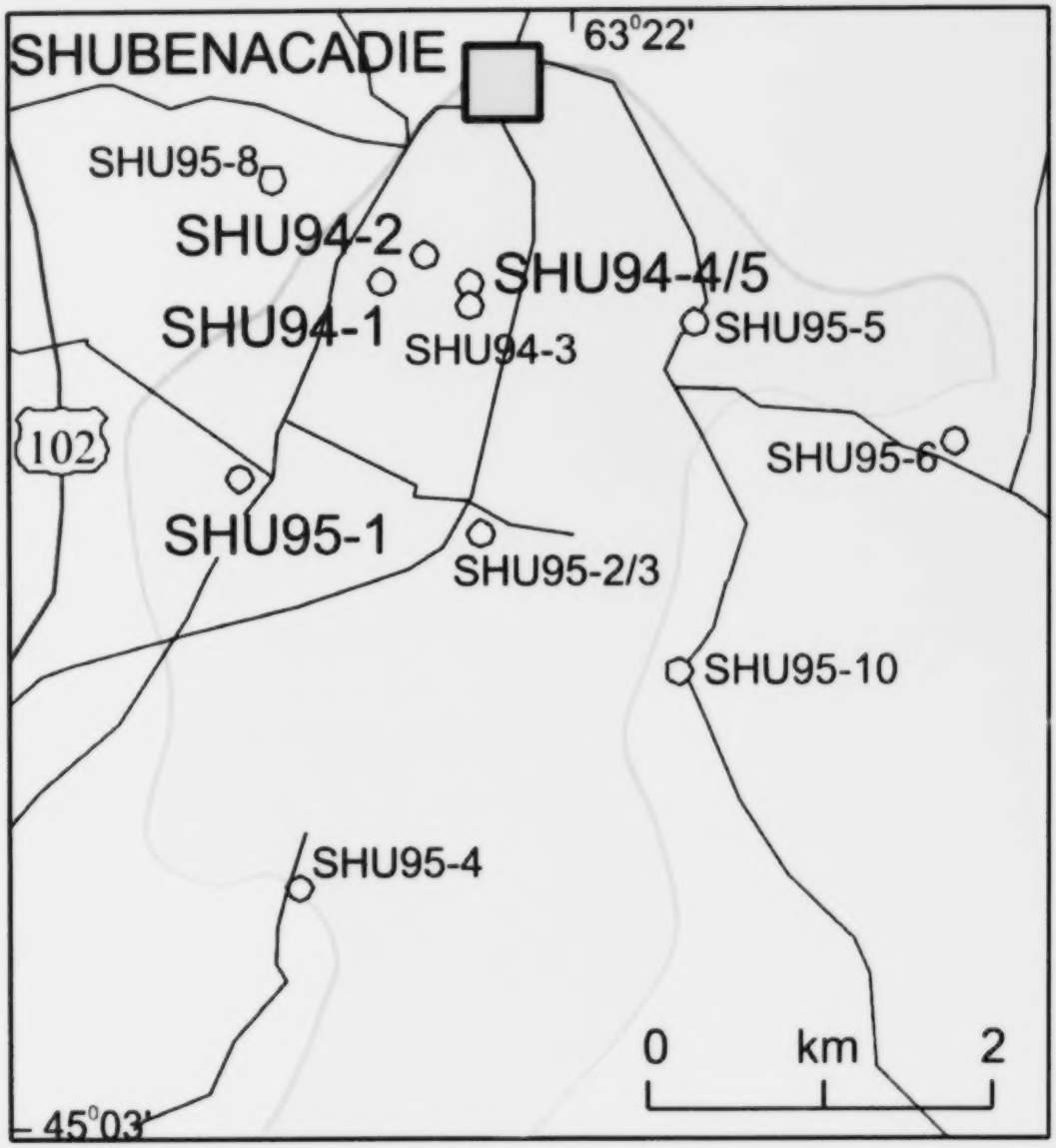


Figure 2. Location map for boreholes in the Shubenacadie Cretaceous outlier.

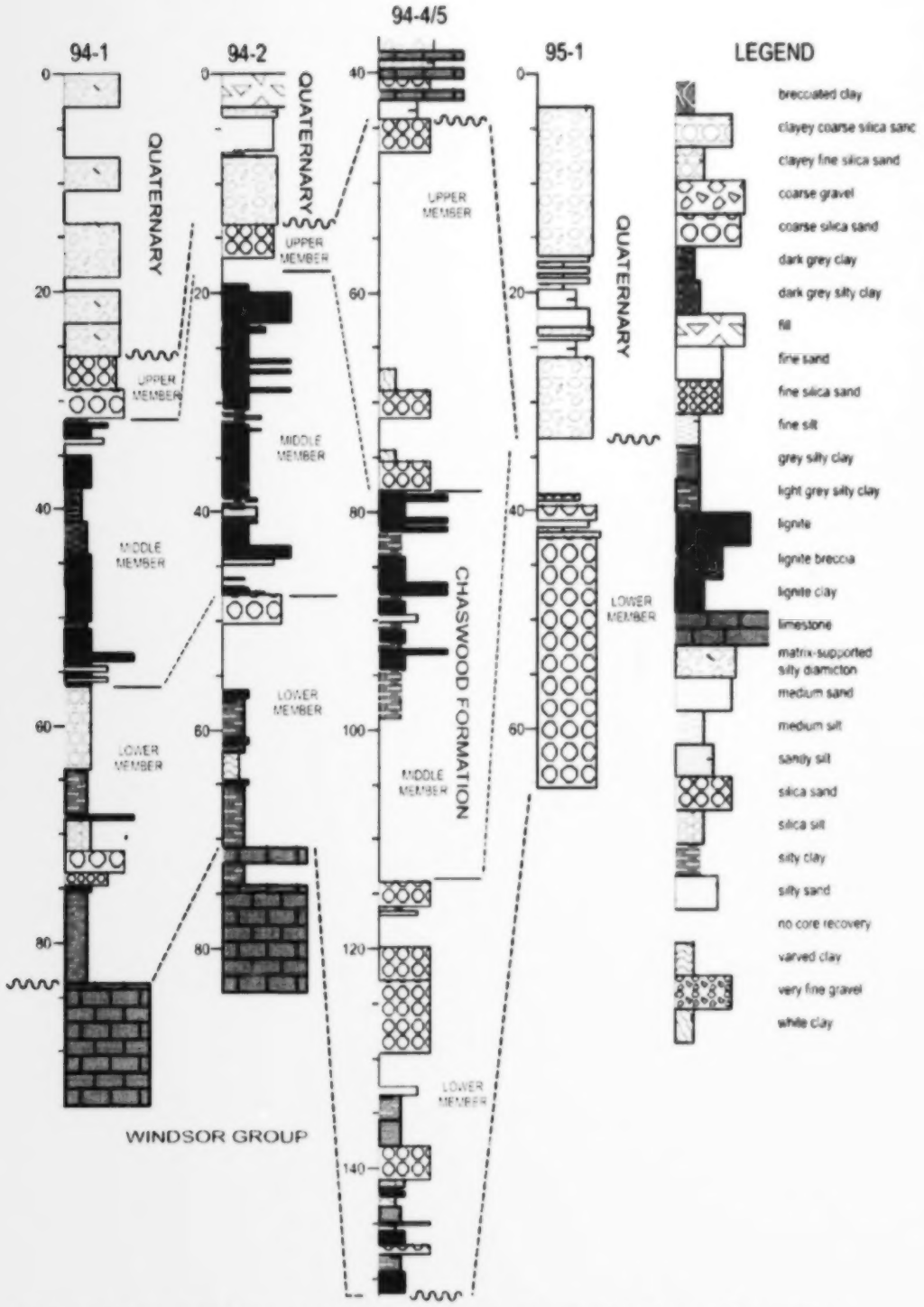


Figure 3. Stratigraphic correlation of boreholes used in this study (modified from Stea and Pullan (2001)

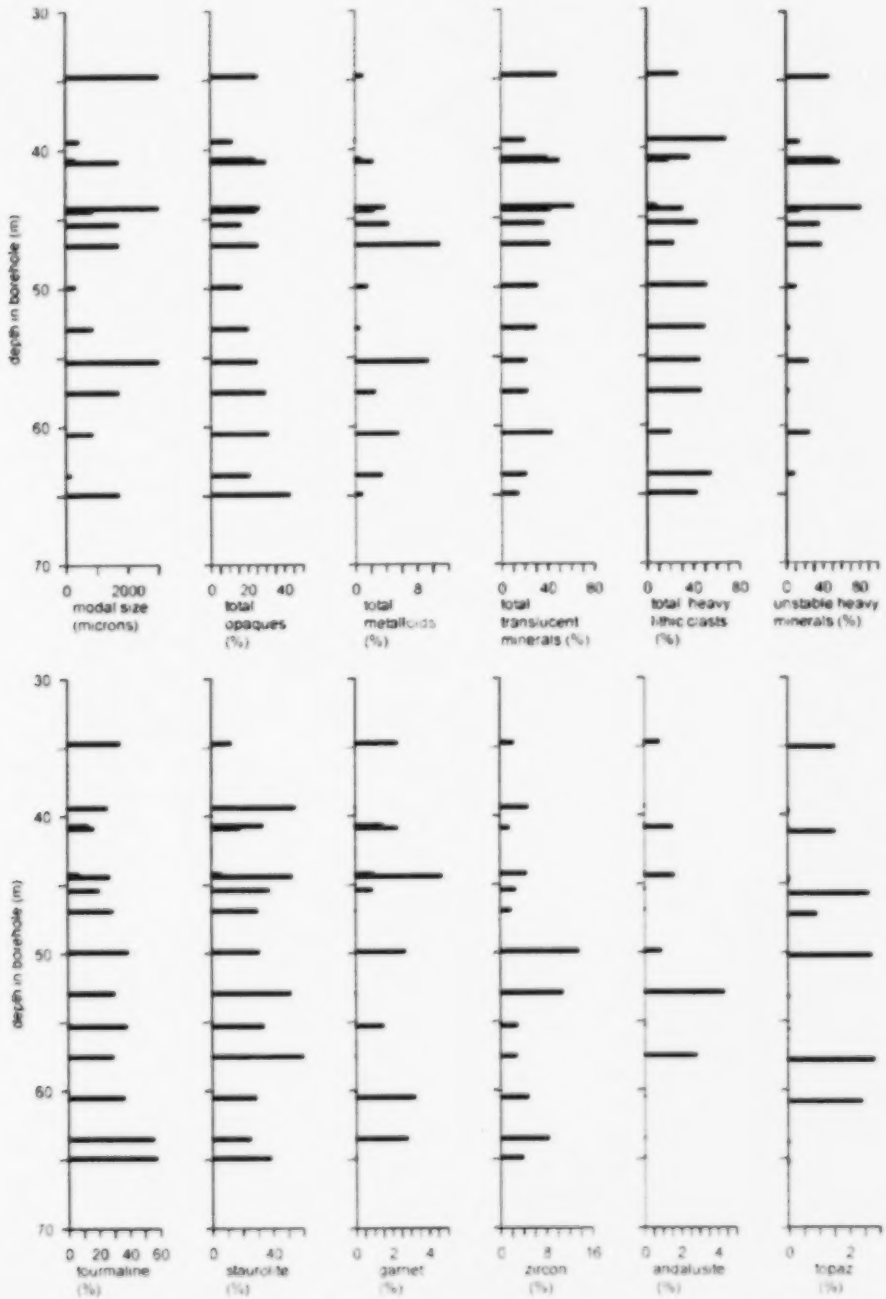
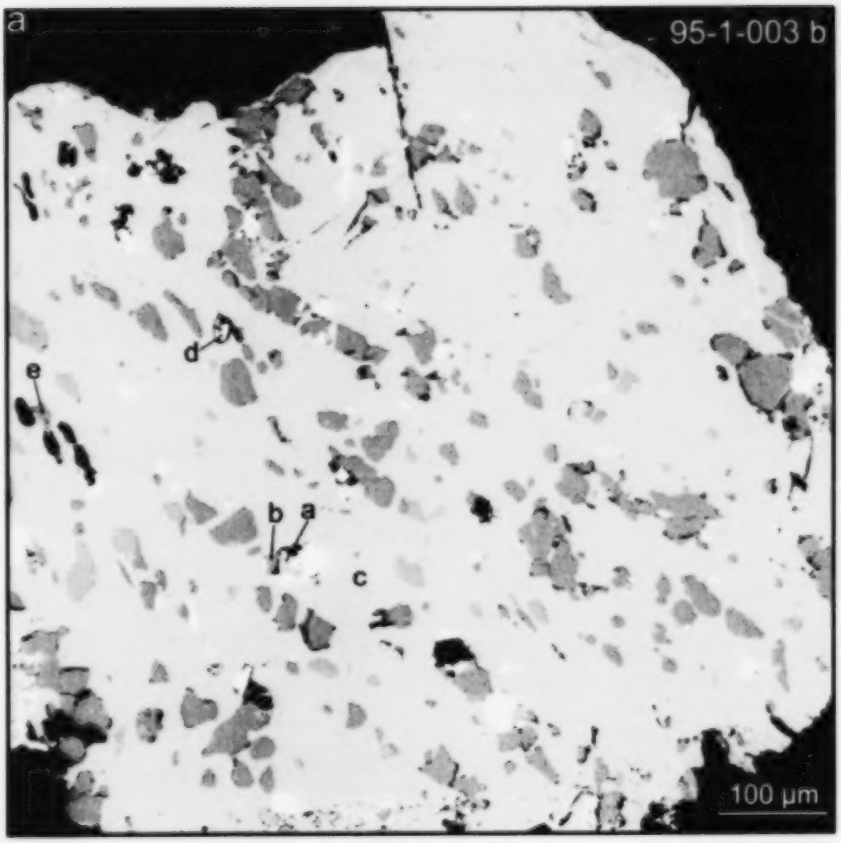
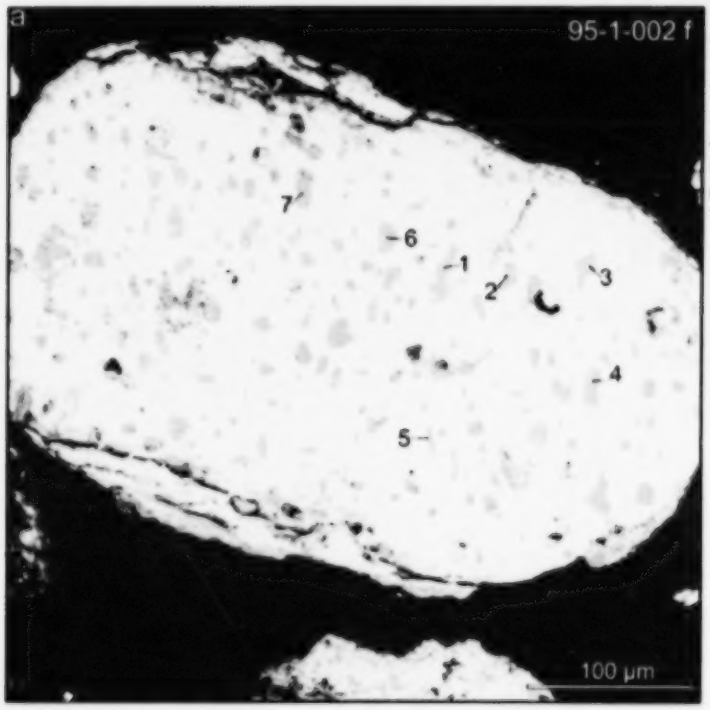


Figure 4. Stratigraphic distribution of percentage of various heavy minerals with depth for the SHU95-1 borehole

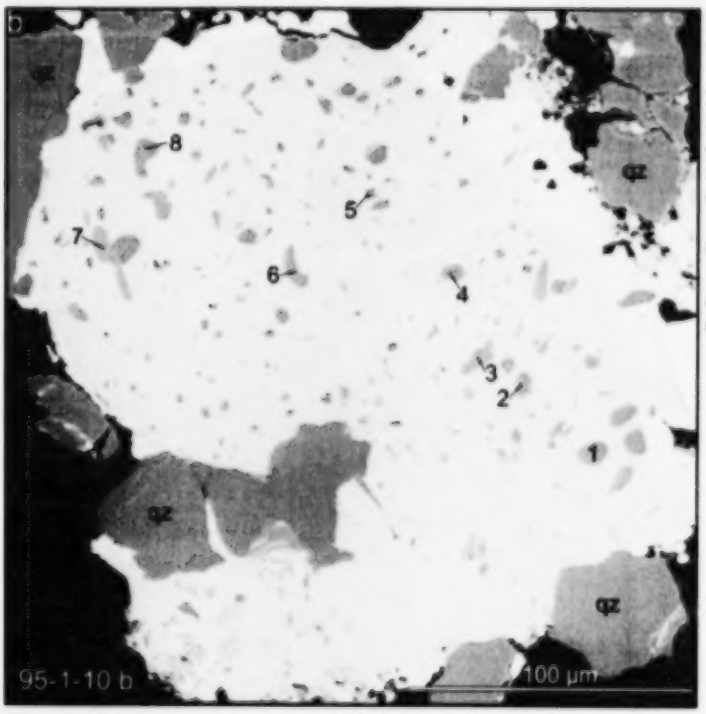


Staurolite crystal
a. staurolite
b. quartz
c. staurolite
d. Pb contaminant
e. quartz

Figure 5. Backscattered electron image of staurolite.



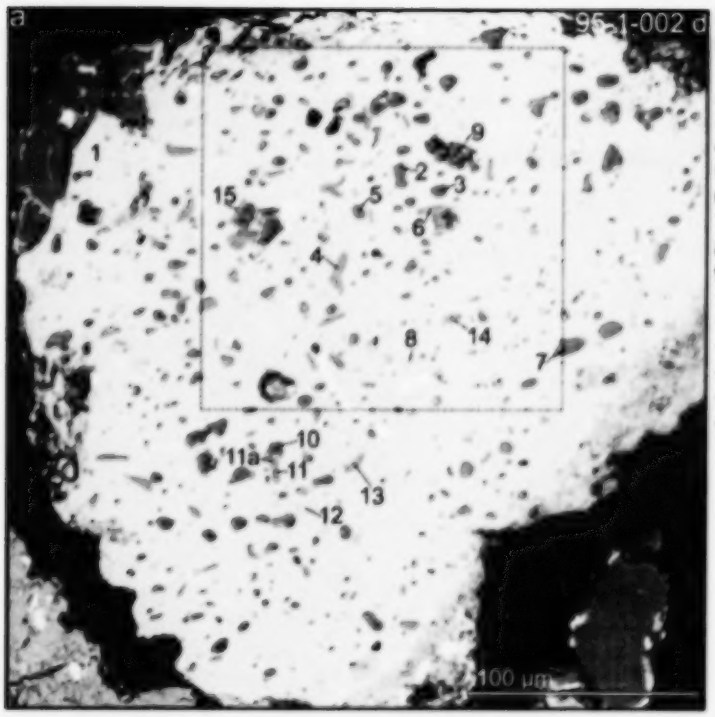
Ilmenite + rutile crystal with inclusions of:
1. muscovite
2. muscovite
3. muscovite
4. muscovite
5. muscovite
6. quartz
7. quartz



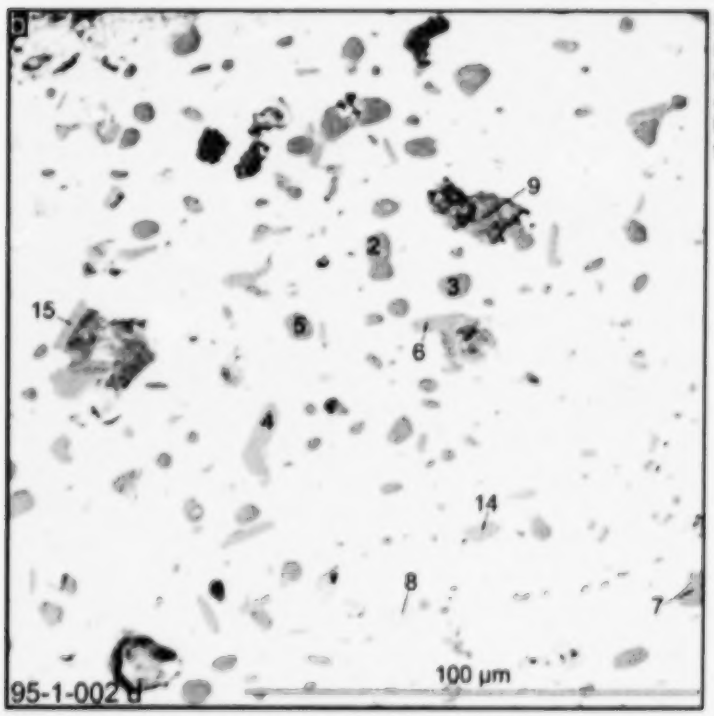
Ilmenite + rutile crystal with inclusions of:
1. quartz
2. quartz
3. muscovite
4. quartz
5. quartz
6. muscovite
7. muscovite
8. quartz

and in contact with quartz (qz) crystals

Figure 6. Backscattered electron images of altered ilmenite.

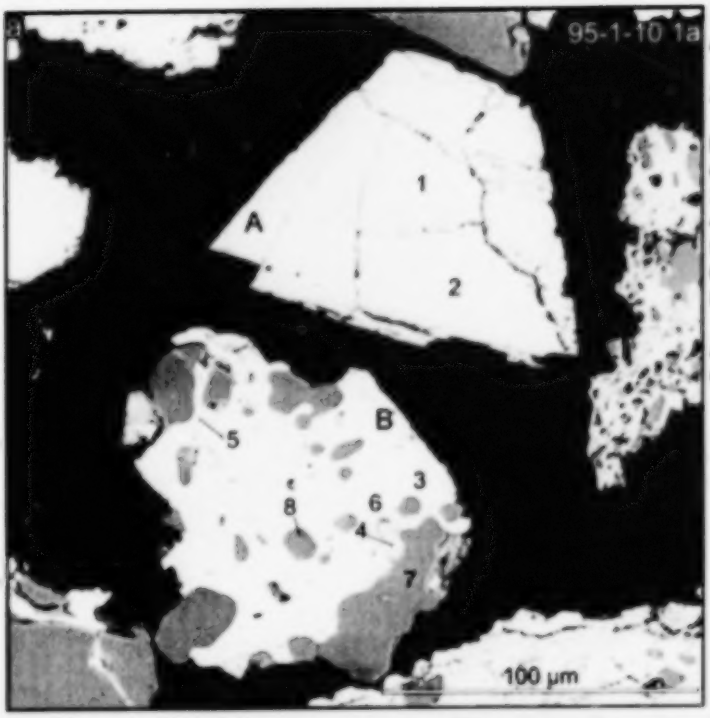


Ilmenite + rutile with inclusions of :
1. quartz
2. quartz
3. quartz
4. muscovite
5. quartz
6. muscovite
7. quartz
8. phosphate
9. tourmaline
10. tourmaline
11a. muscovite
12. phosphate
13. muscovite
14. muscovite
15. muscovite



Ilmenite + rutile with inclusions (blown up area of above image see dotted box). Numbers correspond to numbers above.

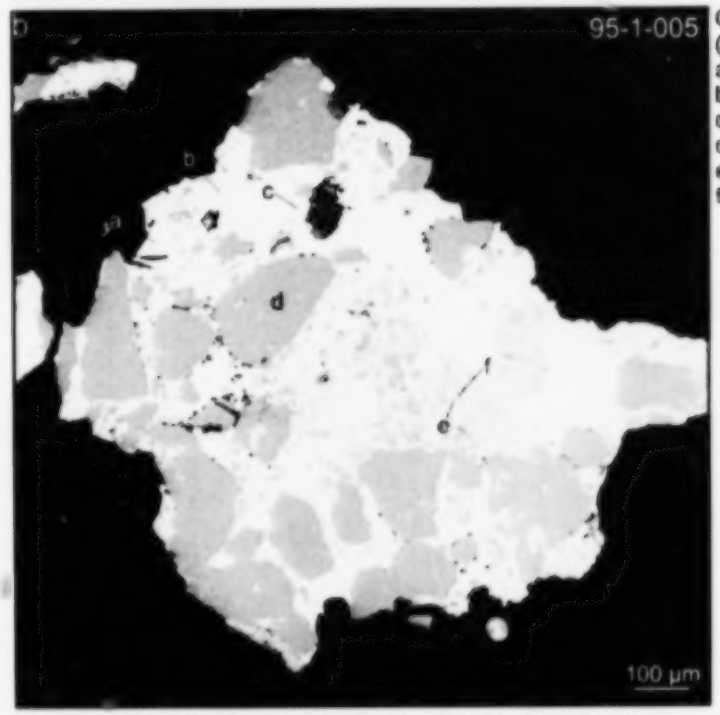
Figure 7. Backscattered electron images of altered ilmenite.



Ilmenite + rutile with
A: spongy texture
1. ilmenite + rutile
2. ilmenite + rutile

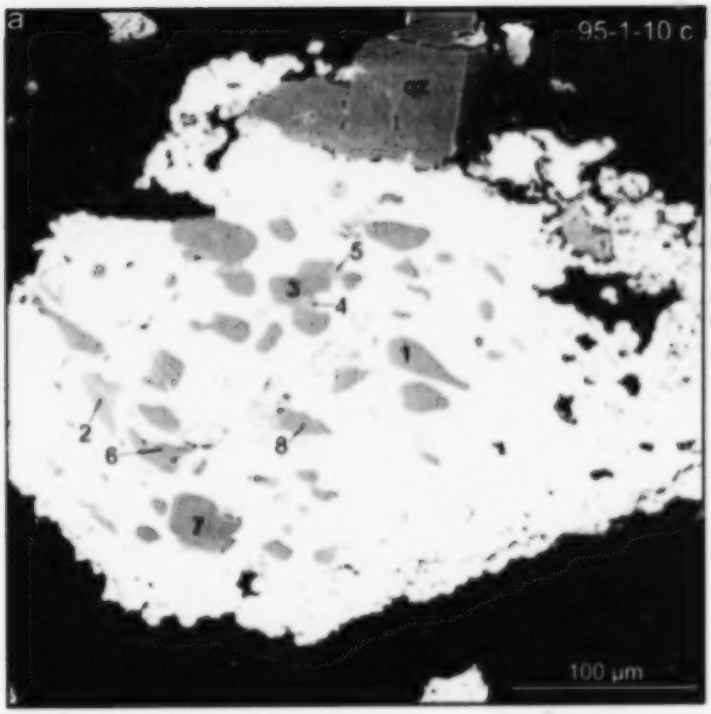
B: Ilmenite + rutile with
quartz and apatite inclusions
3. ilmenite + rutile
4. ilmenite + rutile
5. ilmenite + rutile
6. rutile
8. apatite

and in contact with
quartz crystals (7)



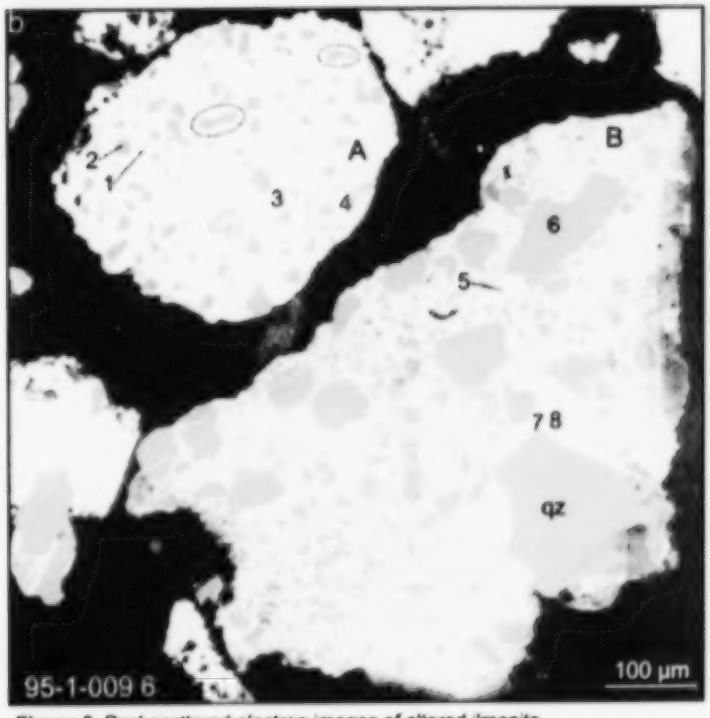
Clast similar to 95-1-10b
(Fig. 1b) but more altered
a. zircon
b. rutile
c. goethite
d. quartz
e. (light area) rutile
f. (dark area) quartz

Figure 8. Backscattered electron images of grains with altered ilmenite.



Ilmenite + rutile crystal
with inclusions of:
1. quartz
2. muscovite
3. quartz
4. tourmaline
5. muscovite
6. quartz
7. quartz
8. quartz

and in contact with quartz (qz)

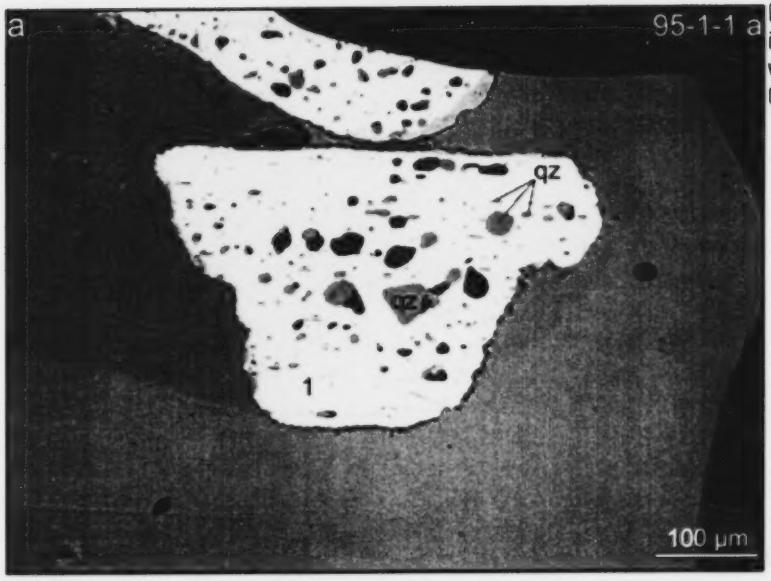


A: Ilmenite + rutile with inclusions of:
1. ilmenite + rutile
2. quartz
3. ilmenite
4. ilmenite + rutile

B: Limonite (?after magnetite)
5. rutile
6. quartz
7. limonite
8. limonite

and in contact with quartz (qz)

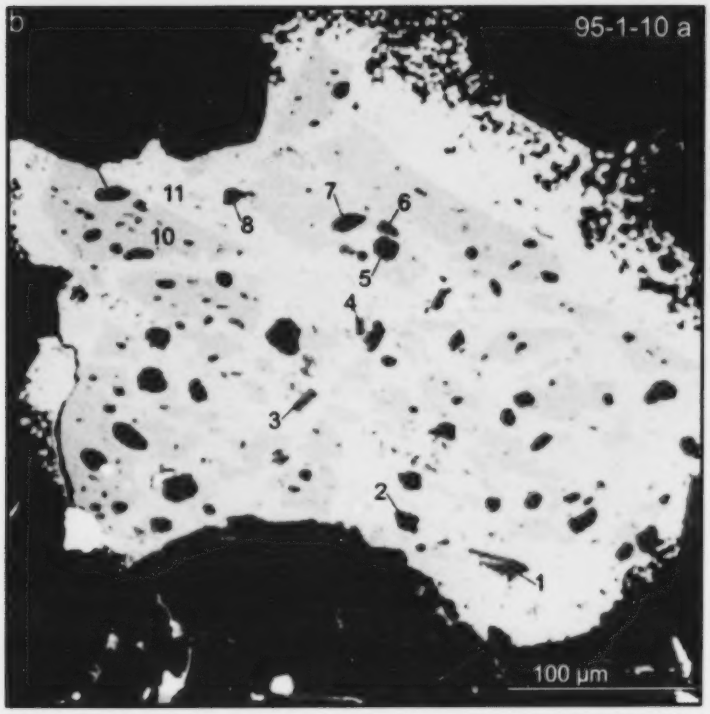
Figure 9. Backscattered electron images of altered ilmenite.



Microphotograph of ilmenite + rutile crystal (1) with quartz (qz) inclusions that display a fabric

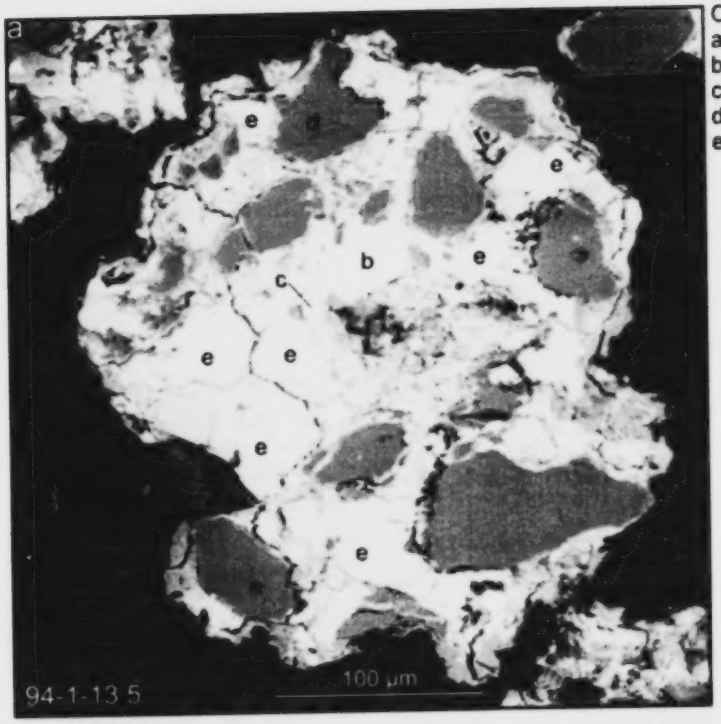
Figure 10. Microphotograph of altered ilmenite.

Magnetite with ilmenite exsolution
a. chlorite
b. ilmenite (exsolution)
c. ilmenite (exsolution)
d. ilmenite (exsolution)
e. chlorite
f. Ti-magnetite

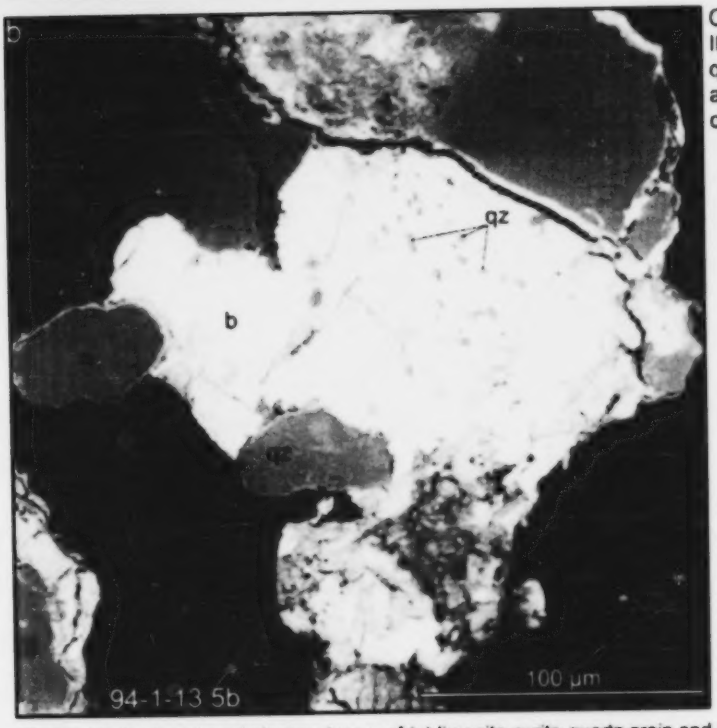


Limonite crystal (?originally magnetite) with:
1. muscovite
2. quartz
3. muscovite
4. muscovite
5. quartz
6. muscovite
7. quartz
8. quartz
9. quartz
10. ilmenite + rutile
11. limonite

Figure 11. Backscattered electron images of grains of magnetite and limonite after magnetite.

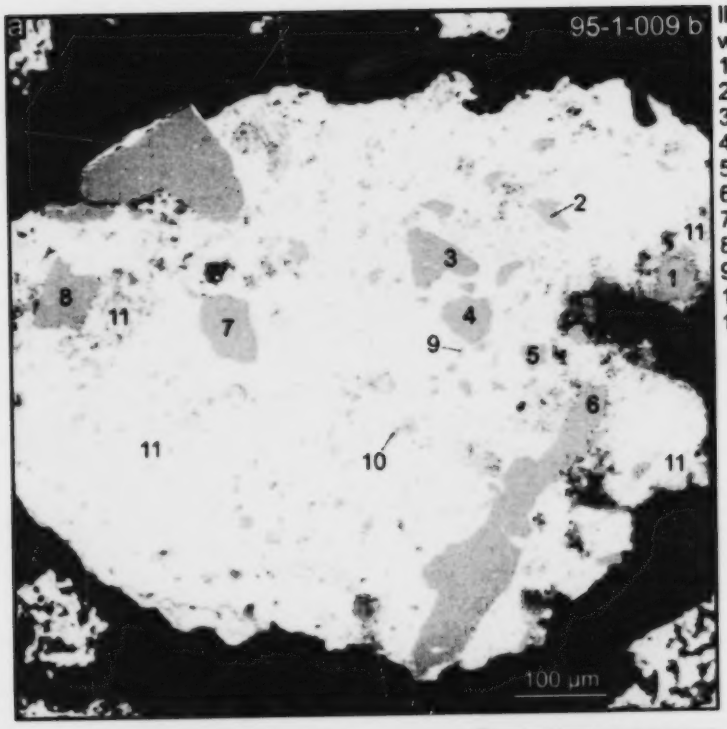


Clast
a. quartz
b. limonite
c. limonite
d. quartz
e. pyrite

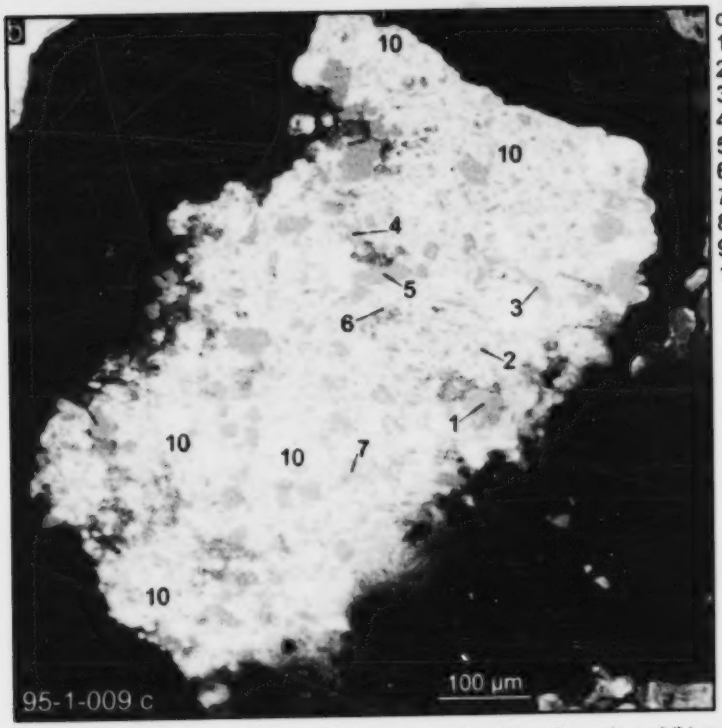


Clast
Ilmenite + rutile (b) with quartz (qz) inclusions and in contact with quartz crystals (a, c, qz)

Figure 12. Backscattered electron image of (a) limonite-pyrite-quartz grain and (b) altered ilmenite + quartz grain.

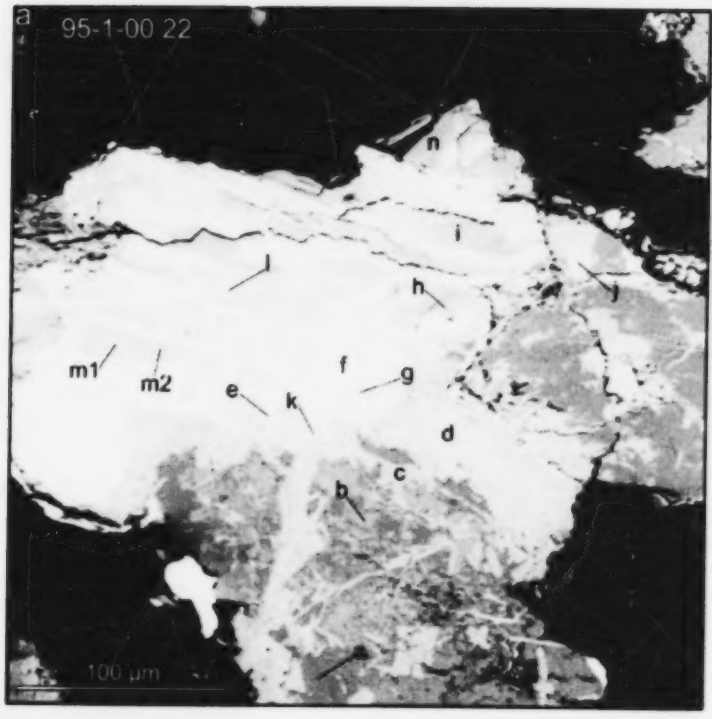


Ilmenite + rutile crystal with inclusions of:
1. quartz
2. quartz
3. quartz
4. quartz
5. quartz
6. quartz
7. quartz
8. quartz
9. quartz
10. quartz
11. limonite

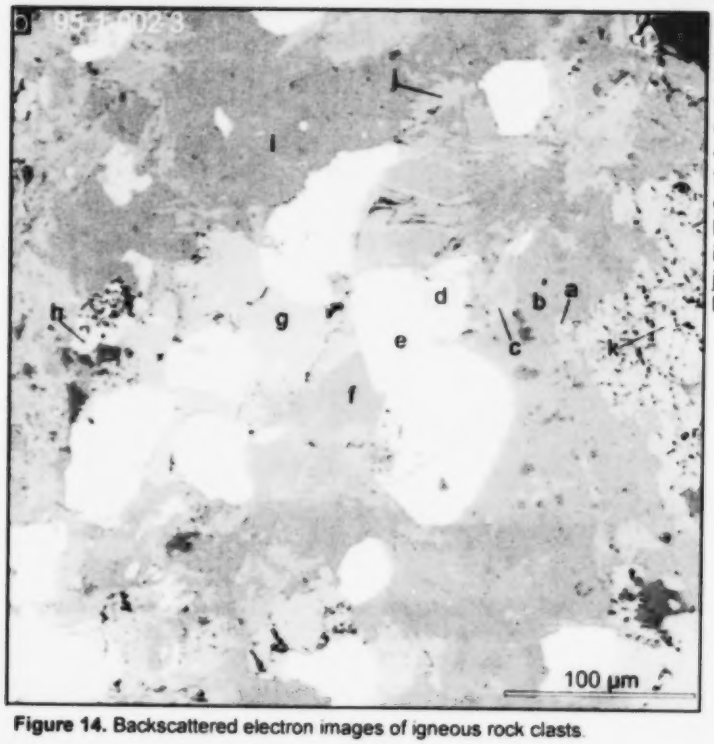


clast
1. quartz
2. quartz
3. quartz
4. quartz
5. quartz
6. muscovite
7. muscovite
8. quartz + muscovite
9. quartz
10. limonite

Figure 13. Backscattered electron image of (a) altered ilmenite grain and (b) quartz-muscovite- limonite grain.

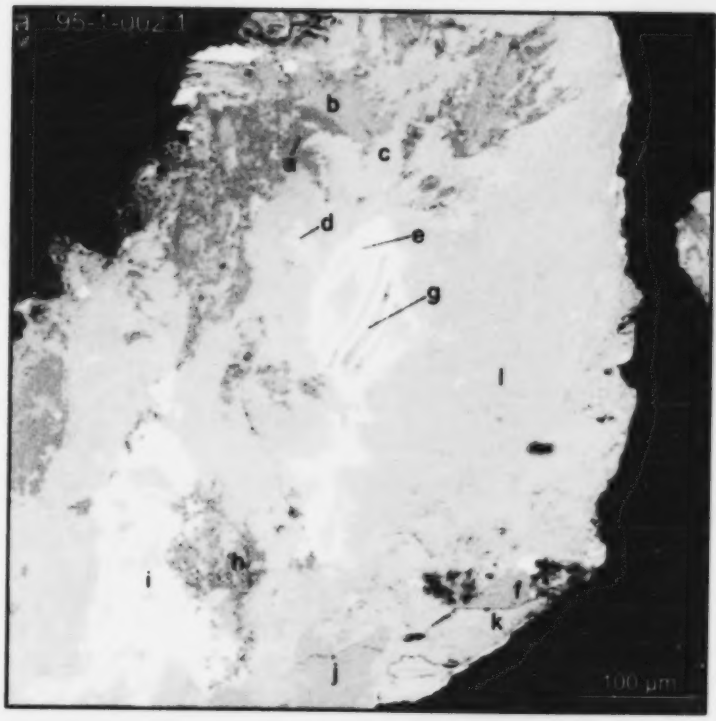


clast of igneous rock
a. plagioclase
b. K-feldspar
c. epidote
d. act. hornblende
e. titanite
f. ilmenite
g. sphene
h. biotite
i. biotite
j. apatite
k. titanite + other silicates
l. hornblende
m1. titanite
m2. biotite
n. biotite



Clast of igneous rock
a. epidote
b. K-feldspar
c. chlorite
d. titanite
e. hematite
f. chlorite
g. epidote
h. apatite
i. K-feldspar
j. chlorite
k. epidote

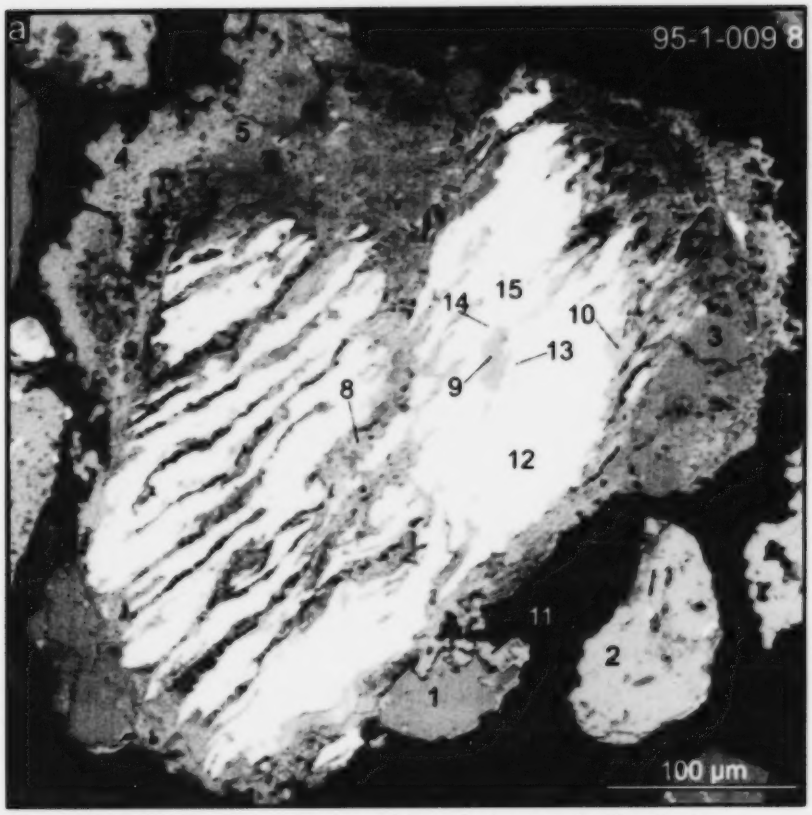
Figure 14. Backscattered electron images of igneous rock clasts.



Clast of igneous rock
a. plagioclase
b. K-feldspar
c. hornblende
d. apatite
e. ilmenite
f. k-feldspar
g. chlorite
h. k-feldspar
i. ilmenite
j. K-feldspar
k. chlorite
l. actinolite

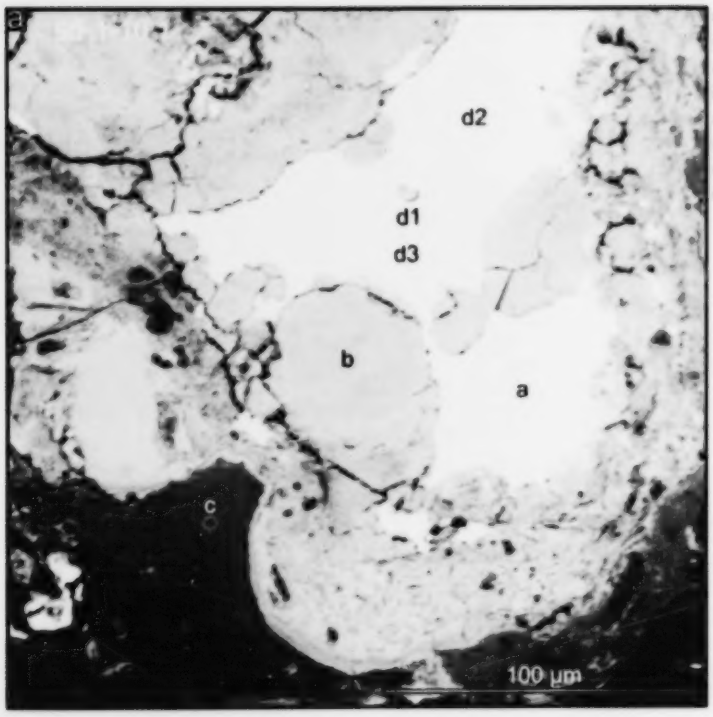
clast of igneous rock
1. hematite
2. titanite
3. plagioclase
4. chlorite
5. titanite
6. chlorite + Fe-oxide
(evidence: ilm→hem + titanite)

Figure 15. Backscattered electron image of igneous rock clasts.

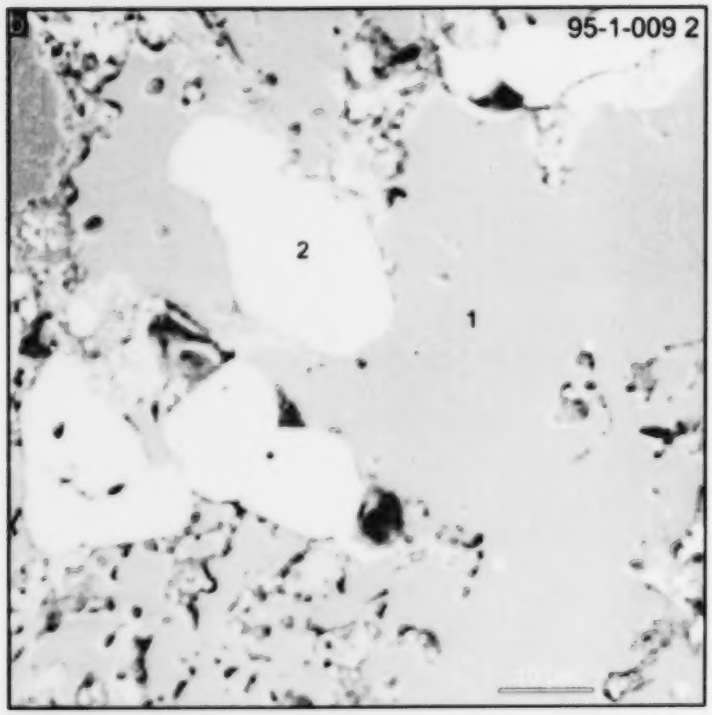


Clast of volcanic rock
1. chlorite
2. limonite
3. quartz
4. Fe-rich silicate
5. limonite
6. limonite
7. quartz
8. quartz + magnetite
9. quartz + magnetite
10. limonite
11. limonite
12. native Fe
13. native Fe
14. native Fe
15. native Fe

Figure 16. Backscattered electron image of clast of volcanic rock with native iron.



calcite - limonite concretion
with a core of native iron
a. native Fe
b. limonite
c. calcite
d1. native Fe
d2. native Fe
d3. native Fe

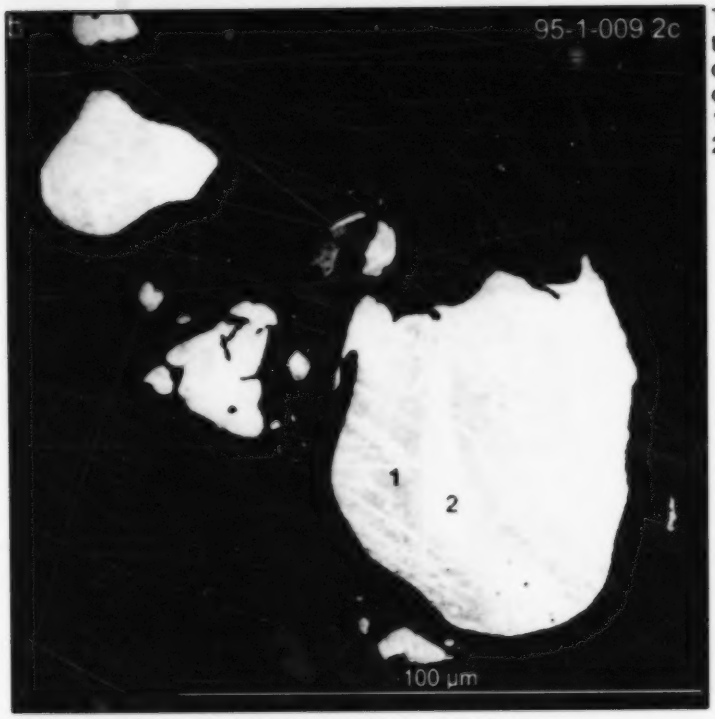


Metalloid clast
1. native Cu
2. Tungsten (W)

Figure 17. Backscattered electron image of (a) concretion around native iron and (b) metalloid clast

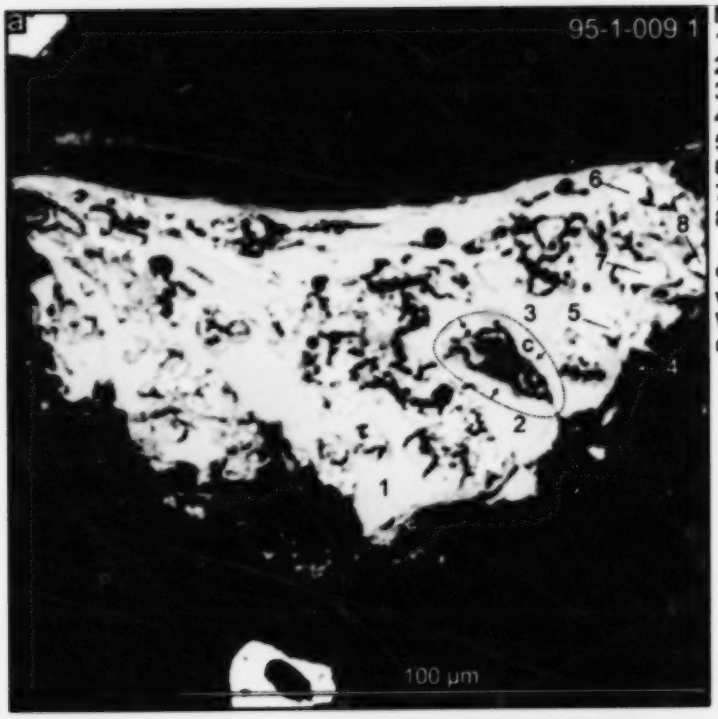
Metalloid clast
1. native Cu + (Ag, Sn, Fe)
2. W metal
3. native Cu
4. alloy (Cu+Sn+Ag)
5. alloy (Cr+Ni+Fe+Cu)
6. alloy (Cu+Sn+Ag+Cr)
7a. alloy (Ag+Cu+Sn)
8. W metal
9. W metal
10. W metal

note the spheroid shape of analyses 5,6, & 7



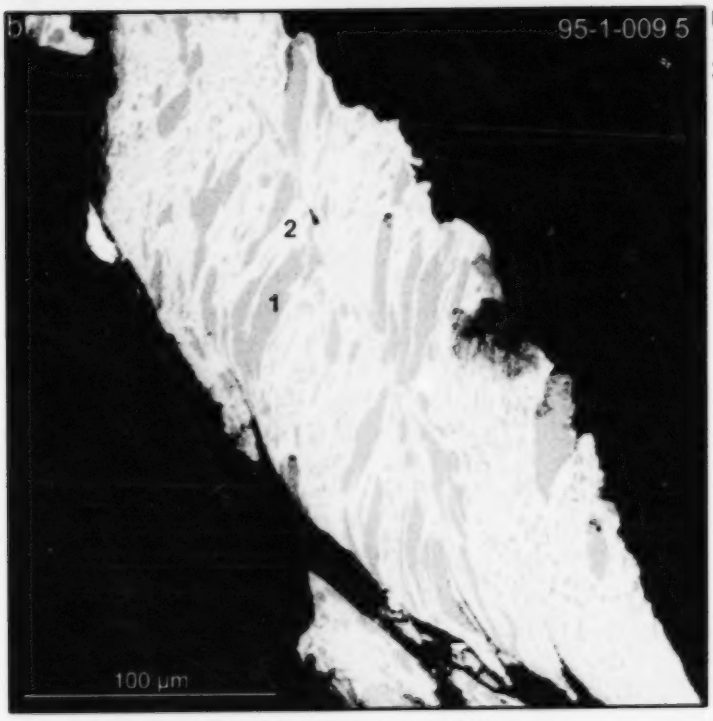
Tungsten (W) grain from the image above (see dotted box): shows distribution of W
1. W metal
2. W metal

Figure 18. Backscattered electron images of metalloid clasts.



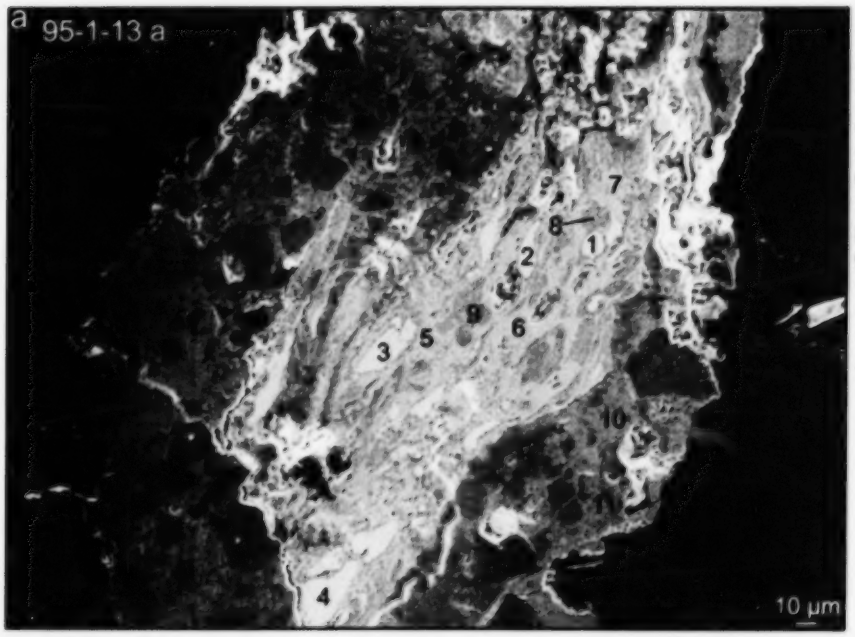
Metalloid clast
1. native Cu + (Ag,Sn,Fe)
2. native Cu + (Ag,Sn,Fe)
3. native Cu + (Ag,Sn,Fe)
4. Ag + (Cu,Fe,S)
5. Sulphide (Ag,Cu,Fe,Sn,W,Cr)
6. sulphide (Cu,Fe,Ag,Sn)
7. W metal
8. W metal

crystallites in the cavity (c) were found to be mostly W with some Th, Sn, Ta, Cr, and Fe

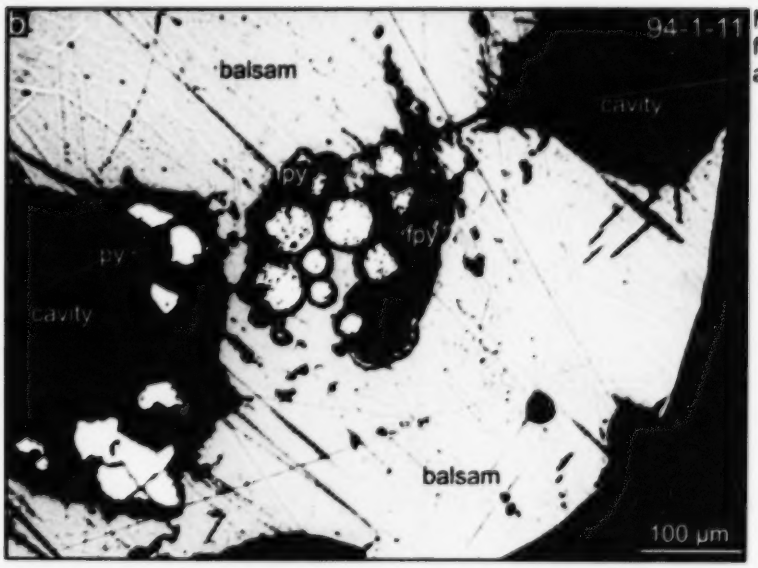


Metalloid clast
1. alloy (Zn,Cu,Ni,Ag)
2. alloy (Ag,Cd,Zn,Cu)

Figure 19. Backscattered electron images of metalloid clasts.

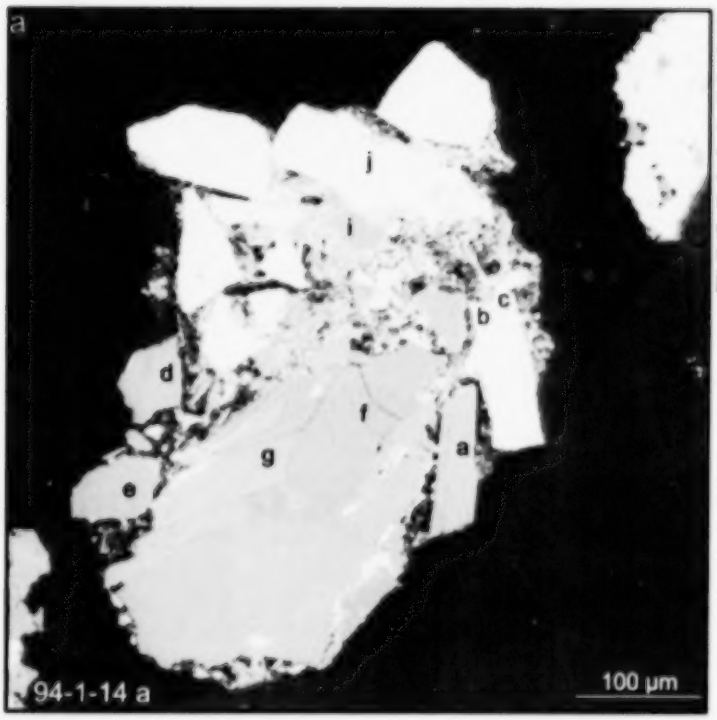


Metalloid
1. alloy (W+Cu+S)
2. alloy (W+Cu)
3. alloy (W+Cu)
4. alloy (W+Cu)
5. alloy (Cu+Zn)
6. alloy (Cu+Zn)
7. alloy (Cu+Zn)
8. alloy (Fe+Cu)
9. alloy (Fe+Cu)
10. alloy (Fe+Cu)
11. alloy (Fe+Cu)
12. calcite
13. quartz

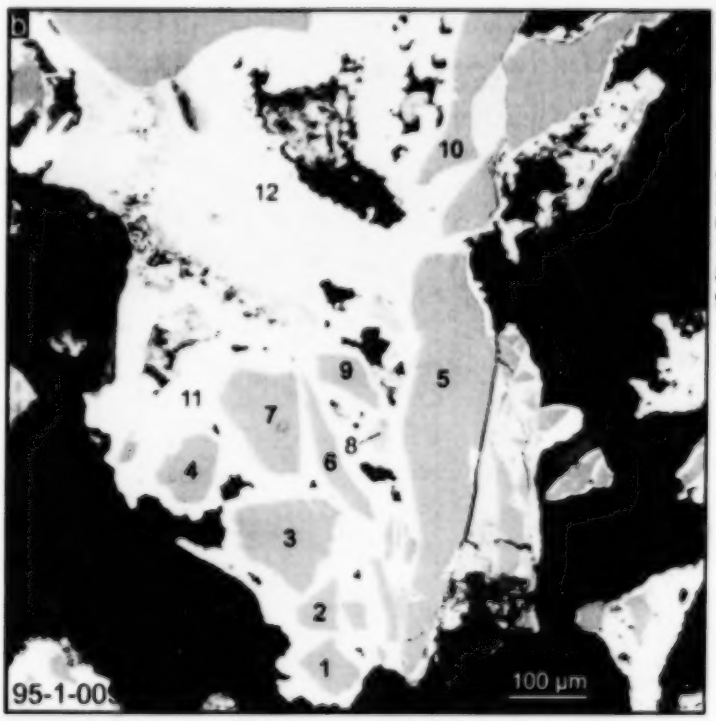


Microphotograph of framboidal pyrite (fpy) and pyrite crystals (py)

Figure 20. Backscattered electron images of (a) metalloid clast and (b) framboidal pyrite.

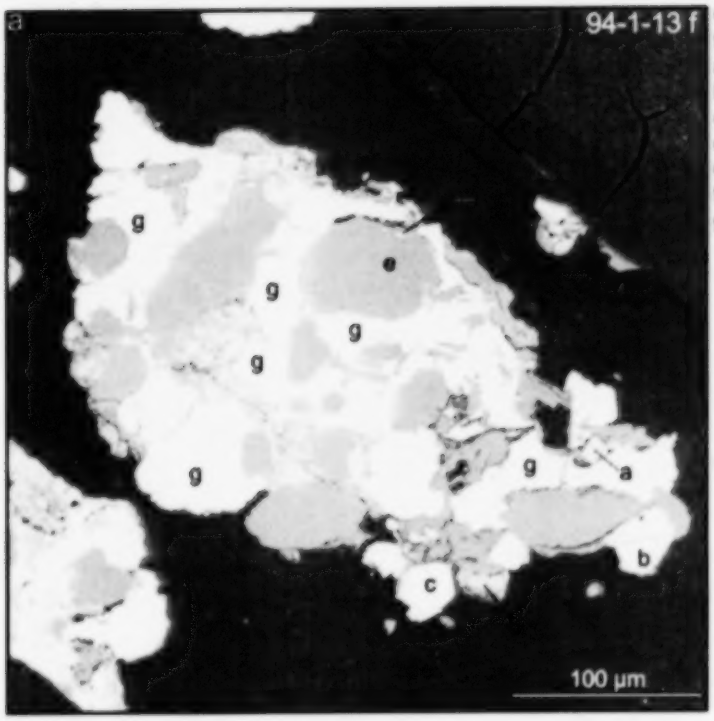


Clast of mineralized quartz sandstone
a. muscovite
b. chalcopyrite
c. sphalerite
d. quartz
e. quartz
f. quartz
g. muscovite
i. quartz
j. pyrite

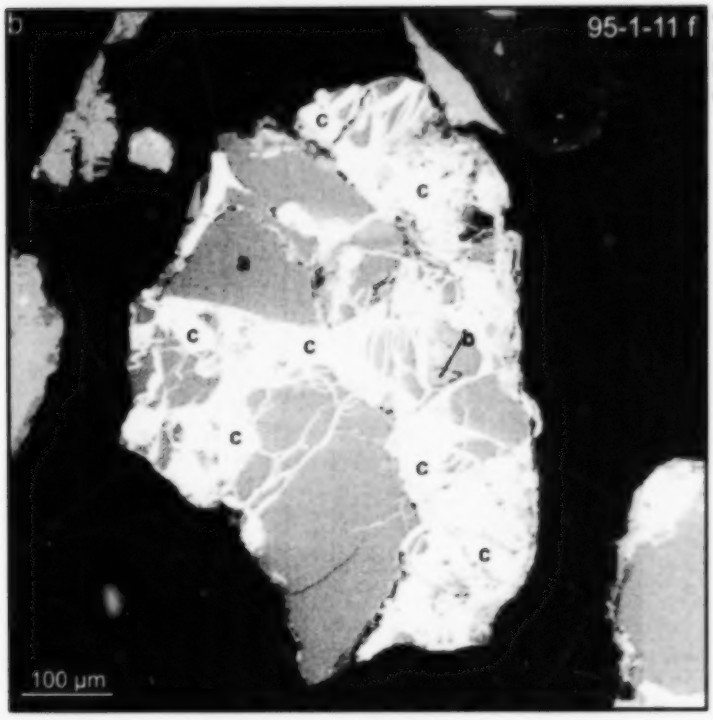


Clast of an unknown fragmental rock (?similar to 94-1-14a)
1. quartz
2. quartz
3. quartz
4. quartz
5. quartz
6. quartz
7. quartz
8. muscovite
9. quartz
10. quartz
11. ilmenite + rutile
12. limonite

Figure 21. Backscattered electron images of mineralized lithic clasts.

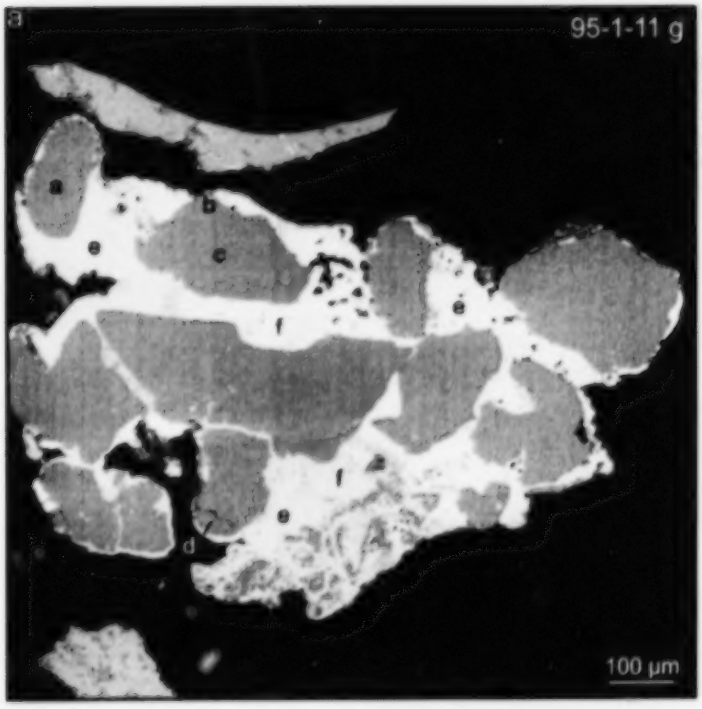


Clast of mineralized fine sandstone
a. rutile
b. pyrite
c. pyrite
d. Pb contaminant
e. quartz
f. pyrite
g. pyrite

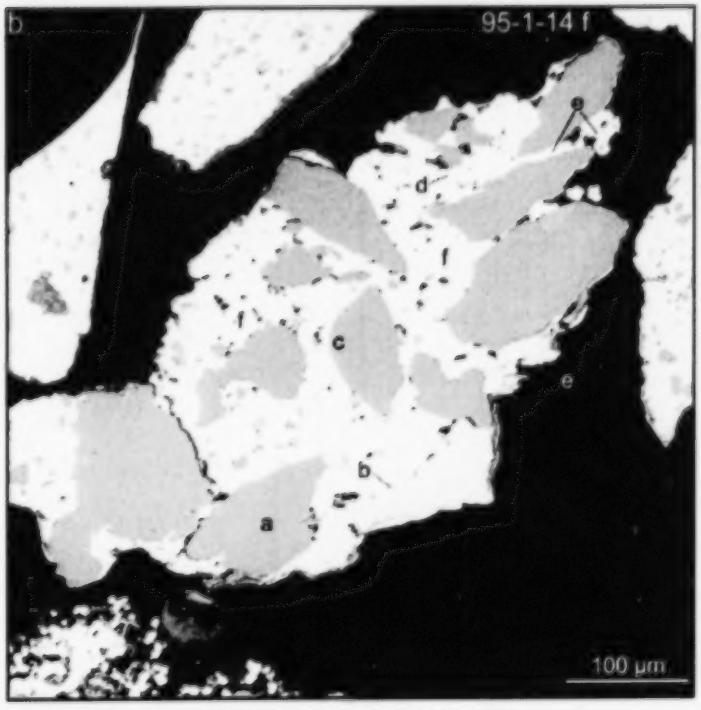


Clast similar to 94-1-13 f
a. quartz
b. Pb contaminant
c. pyrite

Figure 22. Backscattered electron images of mineralized lithic clasts.



clast
a. tourmaline
b. quartz
c. quartz
d. quartz
e. ilmenite + rutile
f. limonite



Clast of an unknown fragmental rock
a. quartz
b. limonite
c. quartz
d. limonite
e. ilmenite + rutile
f. limonite

Figure 23. Backscattered electron images of lithic clasts.

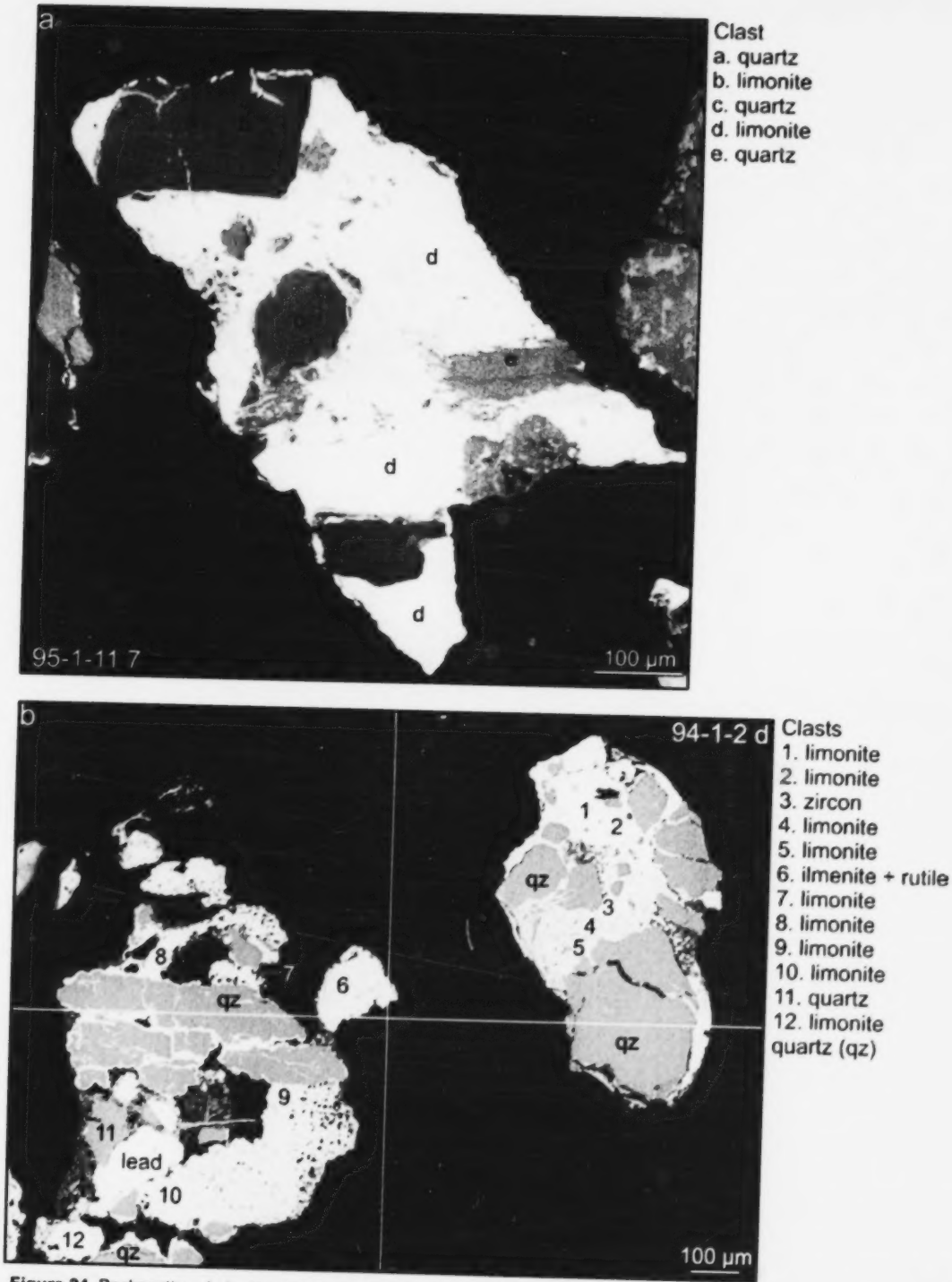
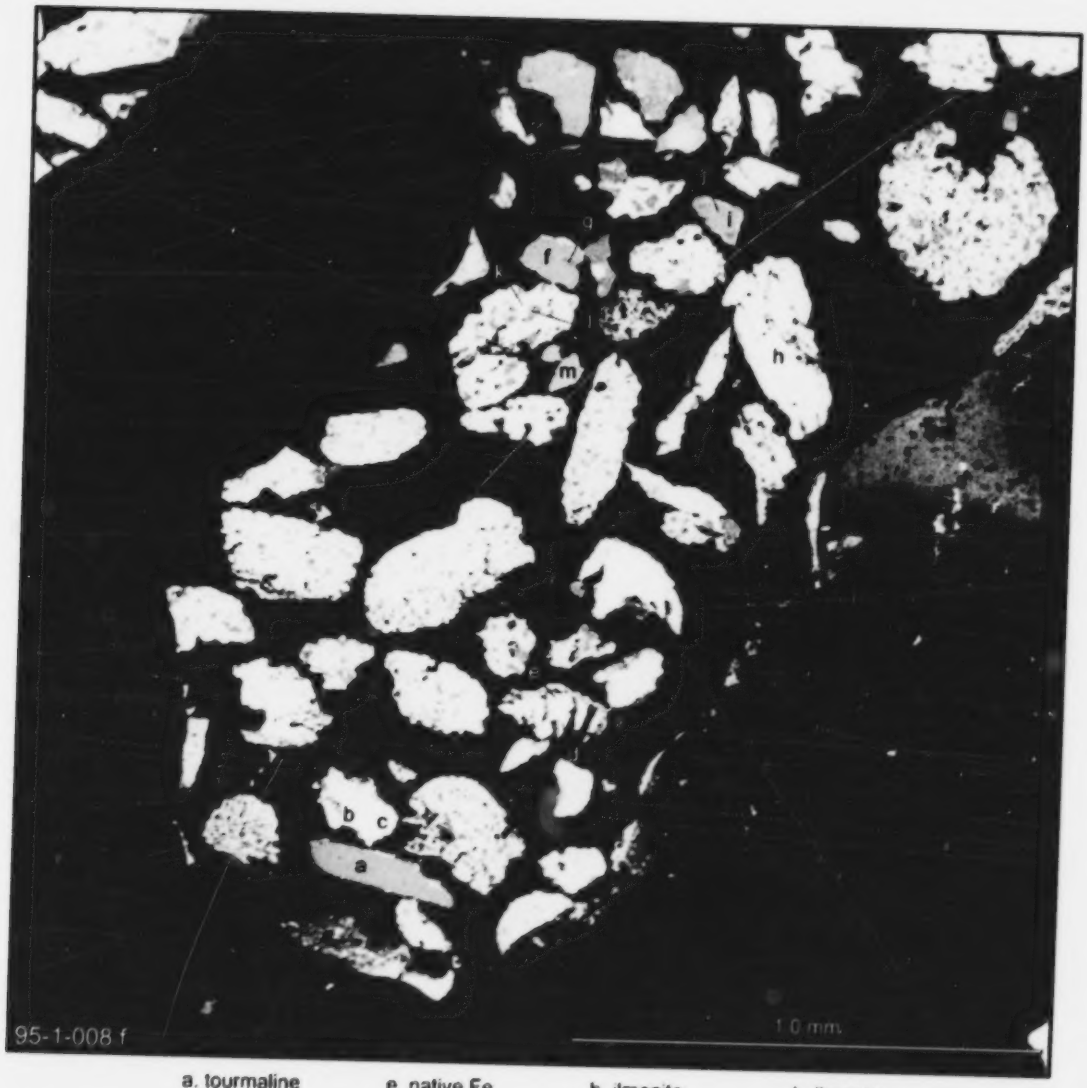
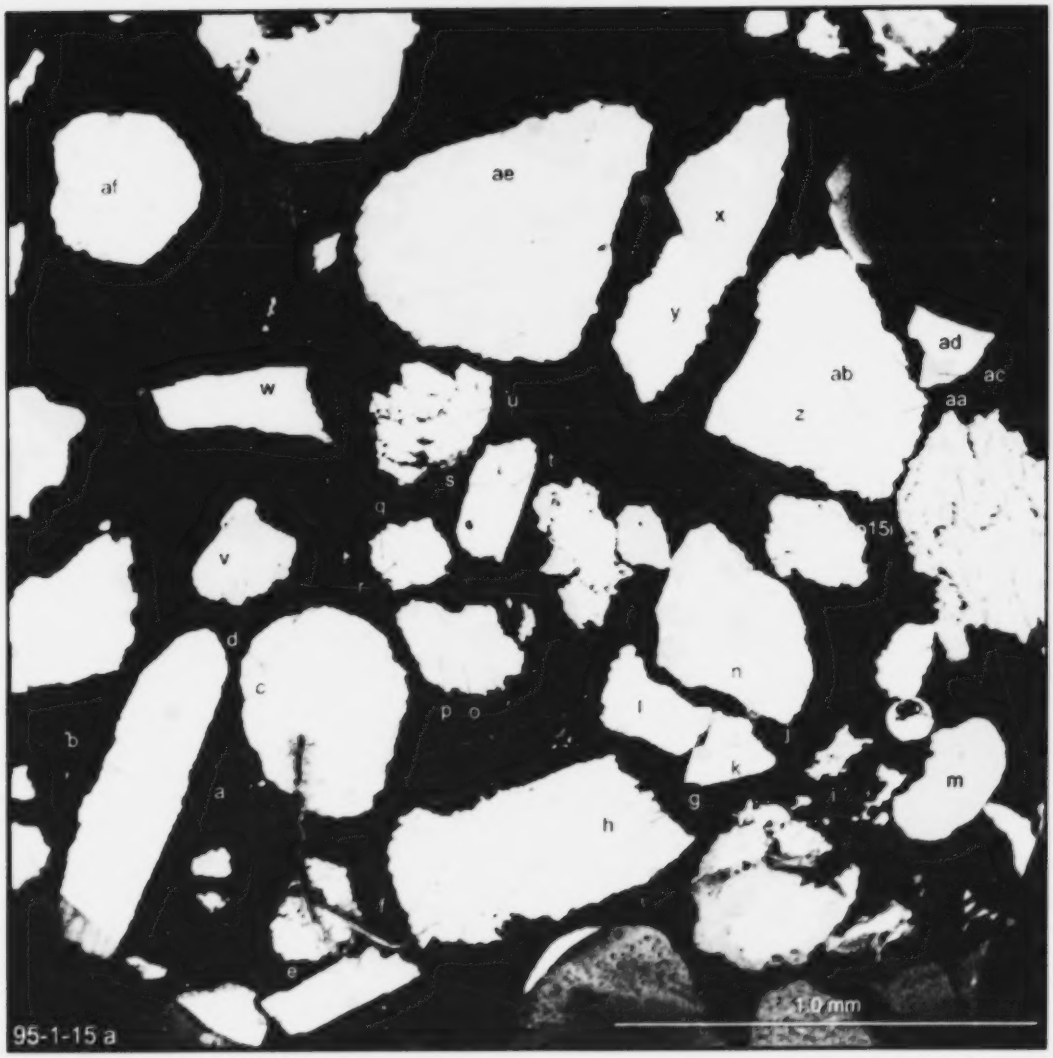


Figure 24. Backscattered electron image of limonite cemented grains.



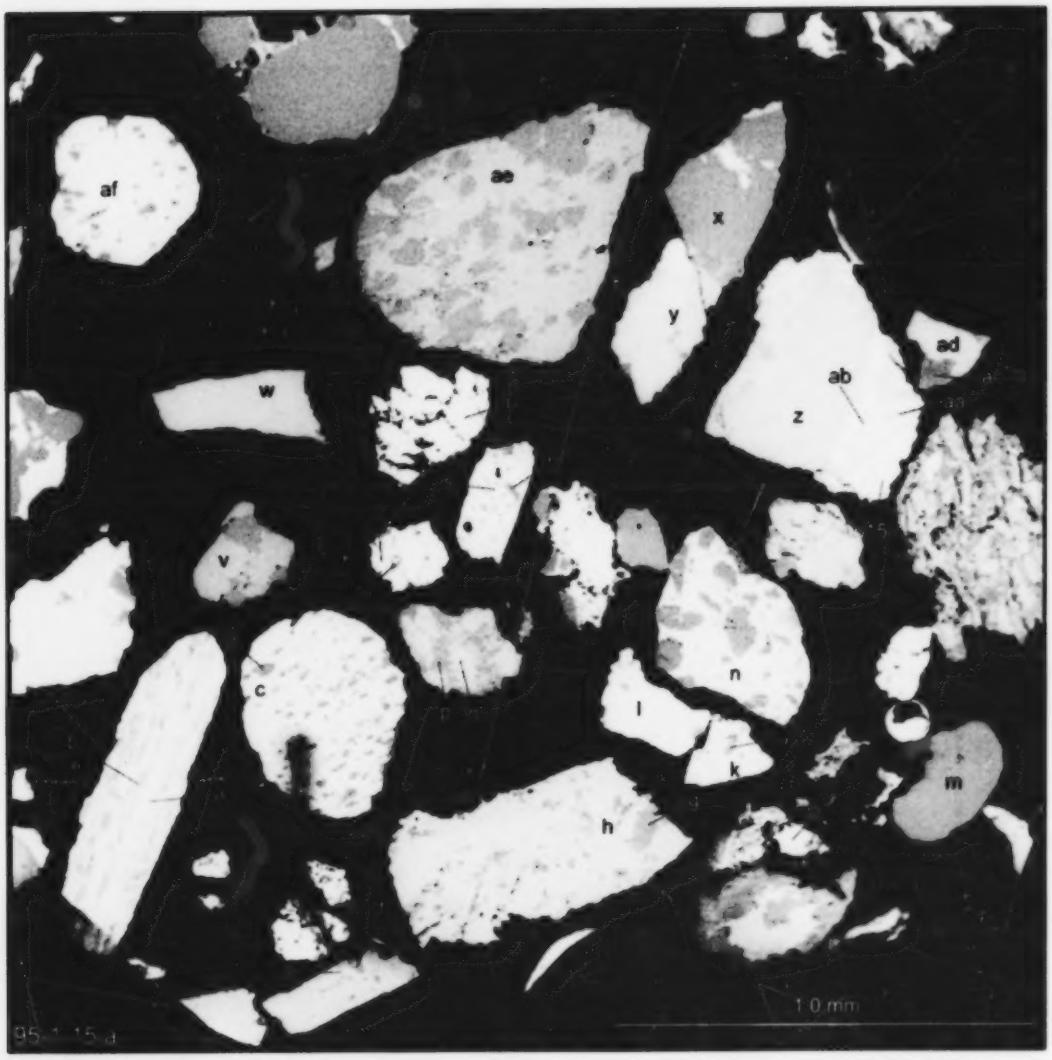
a. tourmaline
b. W metal
c. Zn, Cu, Fe metal
d. native Fe
e. native Fe
f. staurolite
g. quartz
h. ilmenite
i. staurolite
j. quartz
k. ilmenite
l. quartz
m. hornblende

Figure 25. Representative area of a probe thin section of a heavy mineral grain mount. Mineral identification has been confirmed by probe chemical analysis.



a. goethite	h. hornblende	o. epidote	v. staurolite	ab. ilmenite
b. muscovite	i. goethite	p. albite	w. act. hornblende	ac. albite
c. garnet (alm)	j. quartz	q. pyrite	x. andesine	ad. epidote
d. quartz	k. ilmenite + rutile	r. tourmaline	y. hornblende	ae. staurolite
e. hornblende	l. pyrite	s. ilmenite + rutile	z. act. hornblende	af. garnet (alm)
f. quartz	m. quartz	t. quartz	aa. biotite	015i. ilmenite
g. andesine	n. goethite	u. ilmenite + rutile		

Figure 26. Representative area of a probe thin section of a heavy mineral grain mount. Mineral identification has been confirmed by probe chemical analysis.



a. goethite
b. muscovite
c. garnet (alm)
d. quartz
e. hornblende
f. quartz
g. andesine
h. hornblende
i. goethite
j. quartz
k. ilmenite + rutile
l. pyrite
m. quartz
n. goethite
o. epidote
p. albite
q. pyrite
r. tourmaline
s. ilmenite + rutile
t. quartz
u. ilmenite + rutile
v. staurolite
w. act. hornblende
x. andesine
y. hornblende
z. act. hornblende
aa. biotite
ab. ilmenite
ac. albite
ad. epidote
ae. staurolite
af. garnet (alm)
o15i. ilmenite

Figure 26. Representative area of a probe thin section of a heavy mineral grain mount. Mineral identification has been confirmed by probe chemical analysis.

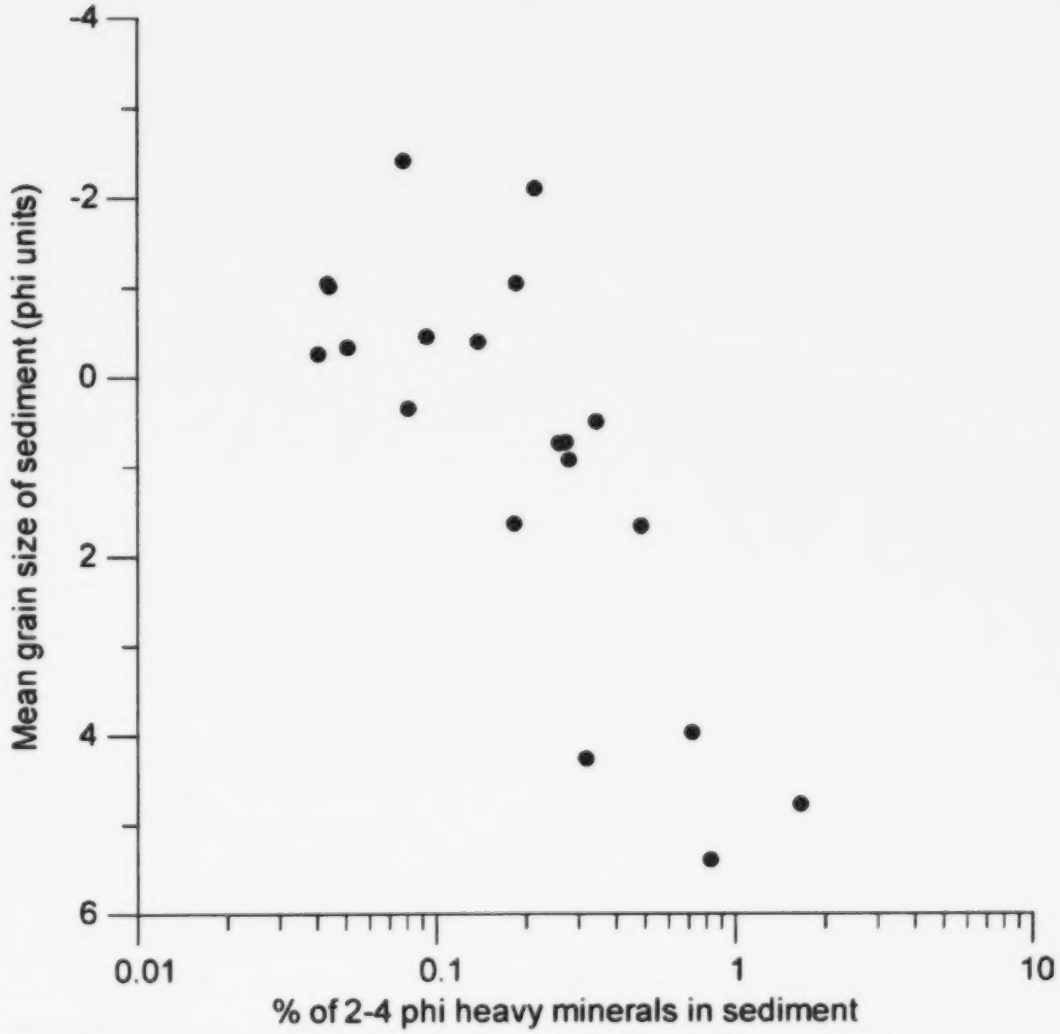


Figure 27. Relationship between heavy mineral abundance in bulk sediment and the mean grain size.

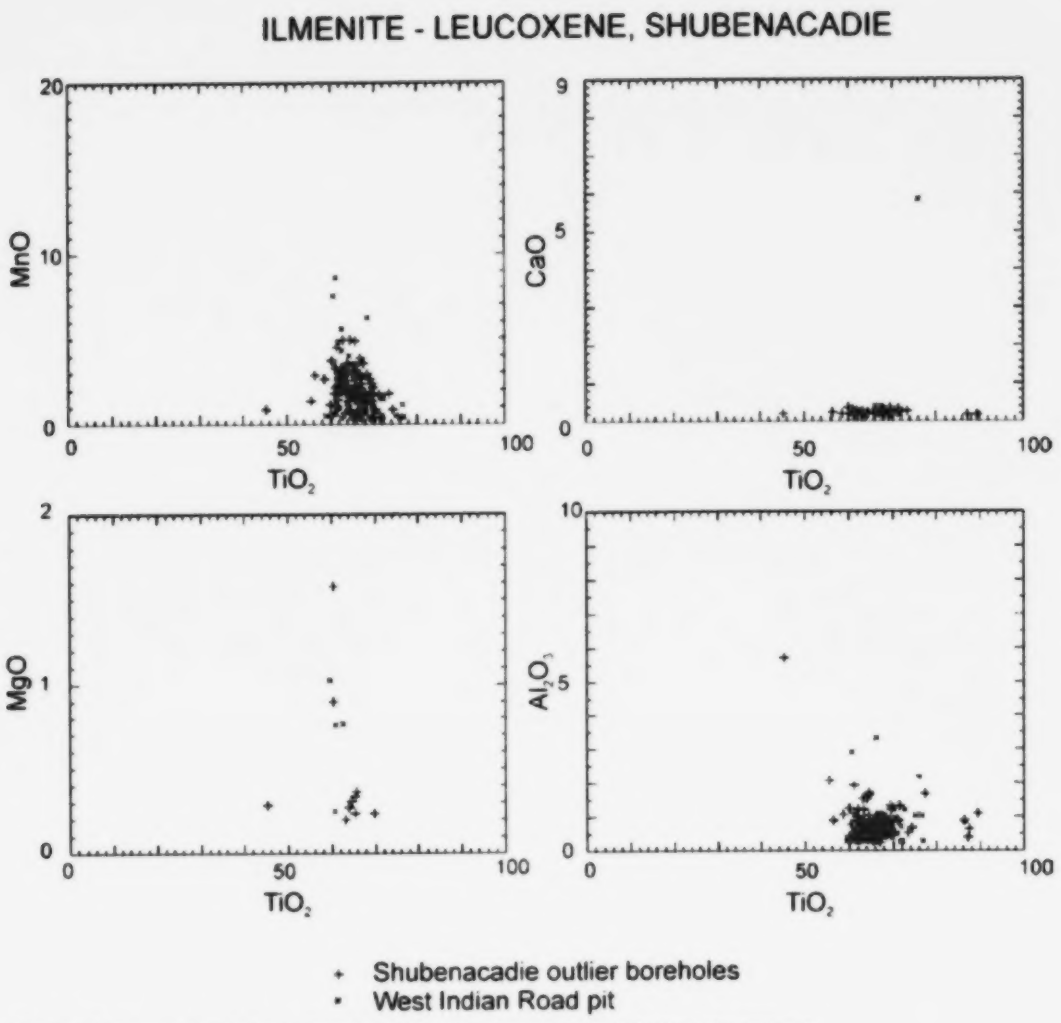


Figure 28. Chemical variation in ilmenite and its alteration products (principally leucoxene).

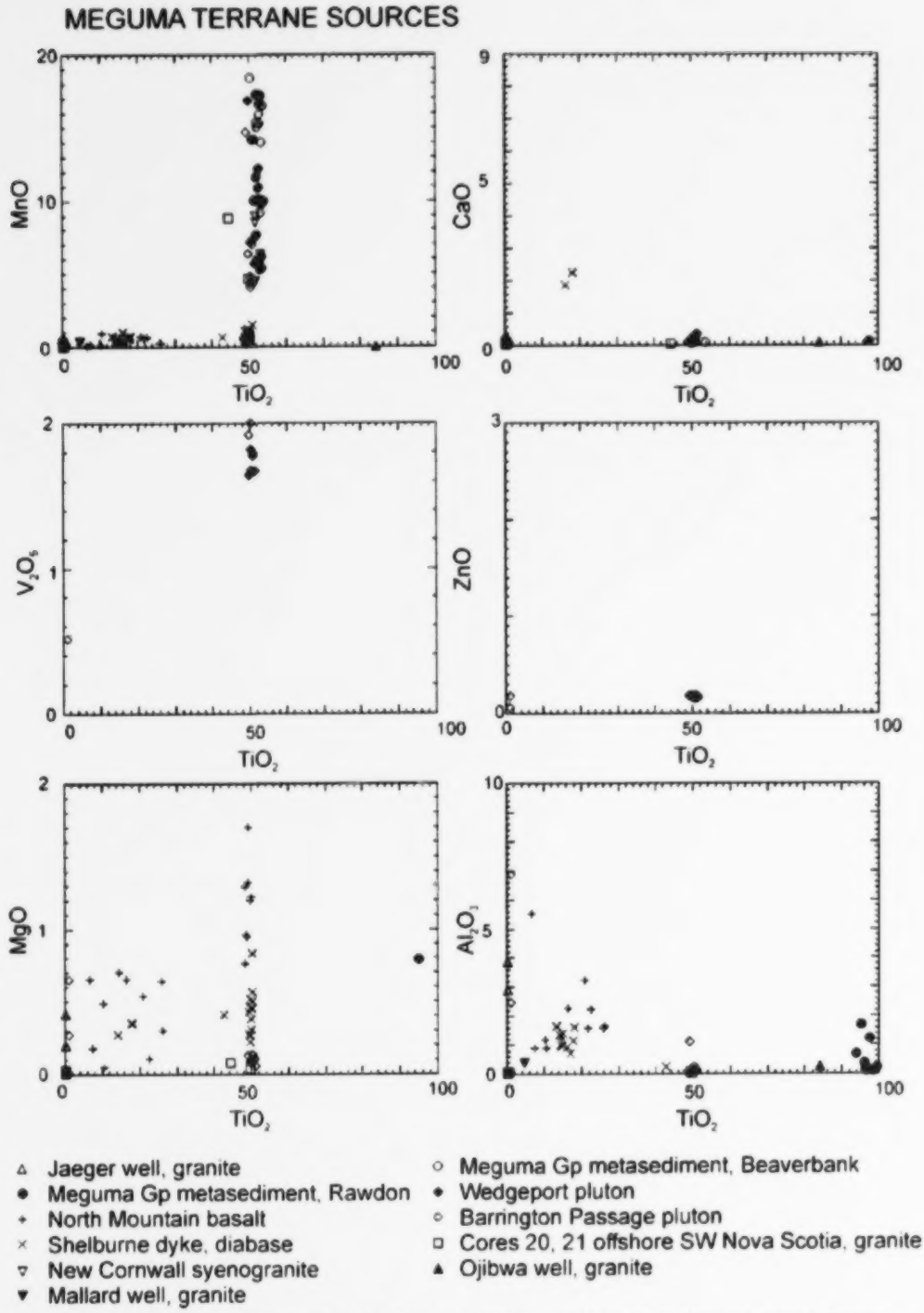


Figure 29. Chemical variation in Fe-Ti oxides from potential sources areas in the Meguma terrane. Sources of data noted in Table 10.

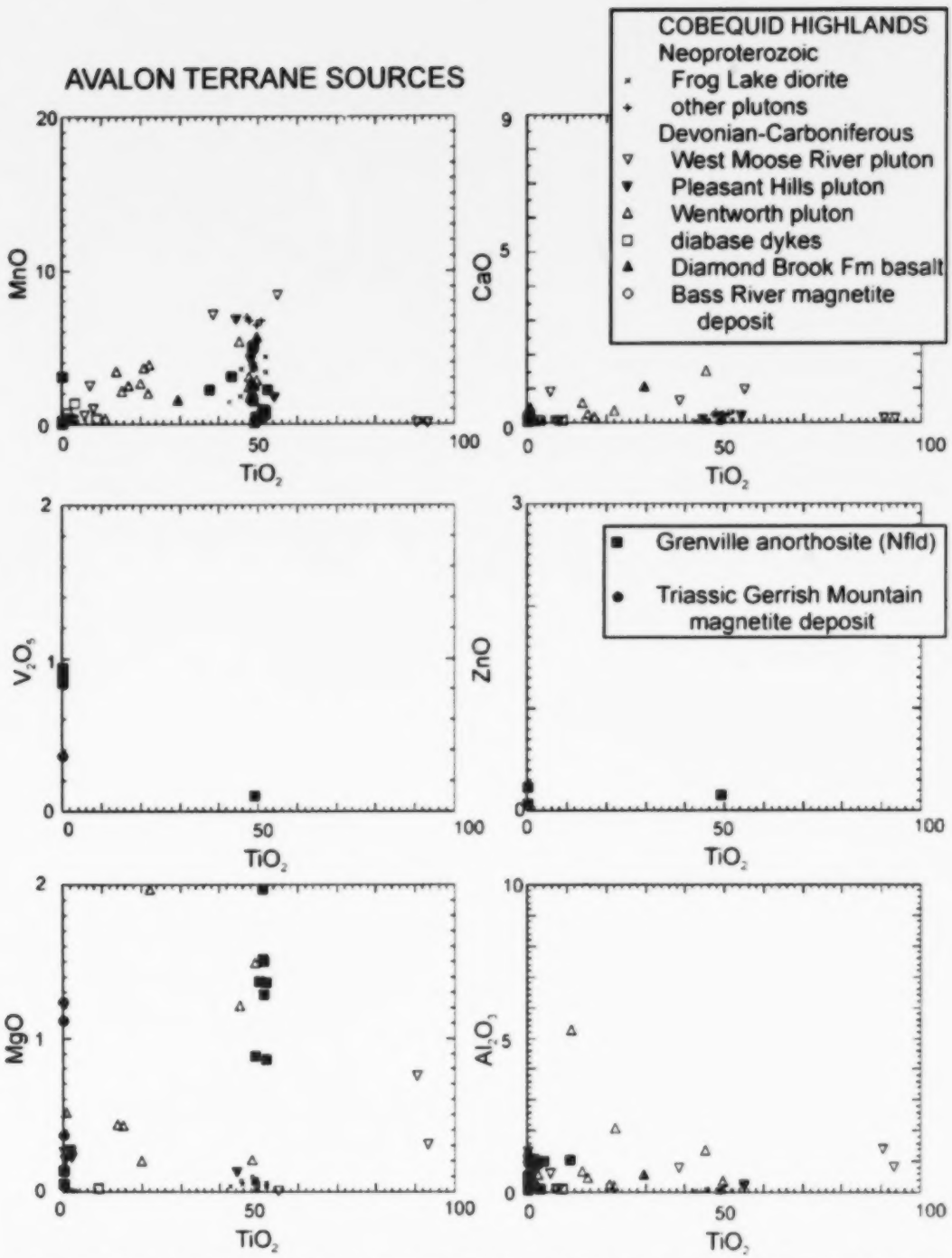


Figure 30. Chemical variation in Fe-Ti oxides from potential sources areas in the Avalon terrane and more inboard parts of the Appalachian orogen. Sources of data noted in Table 10.

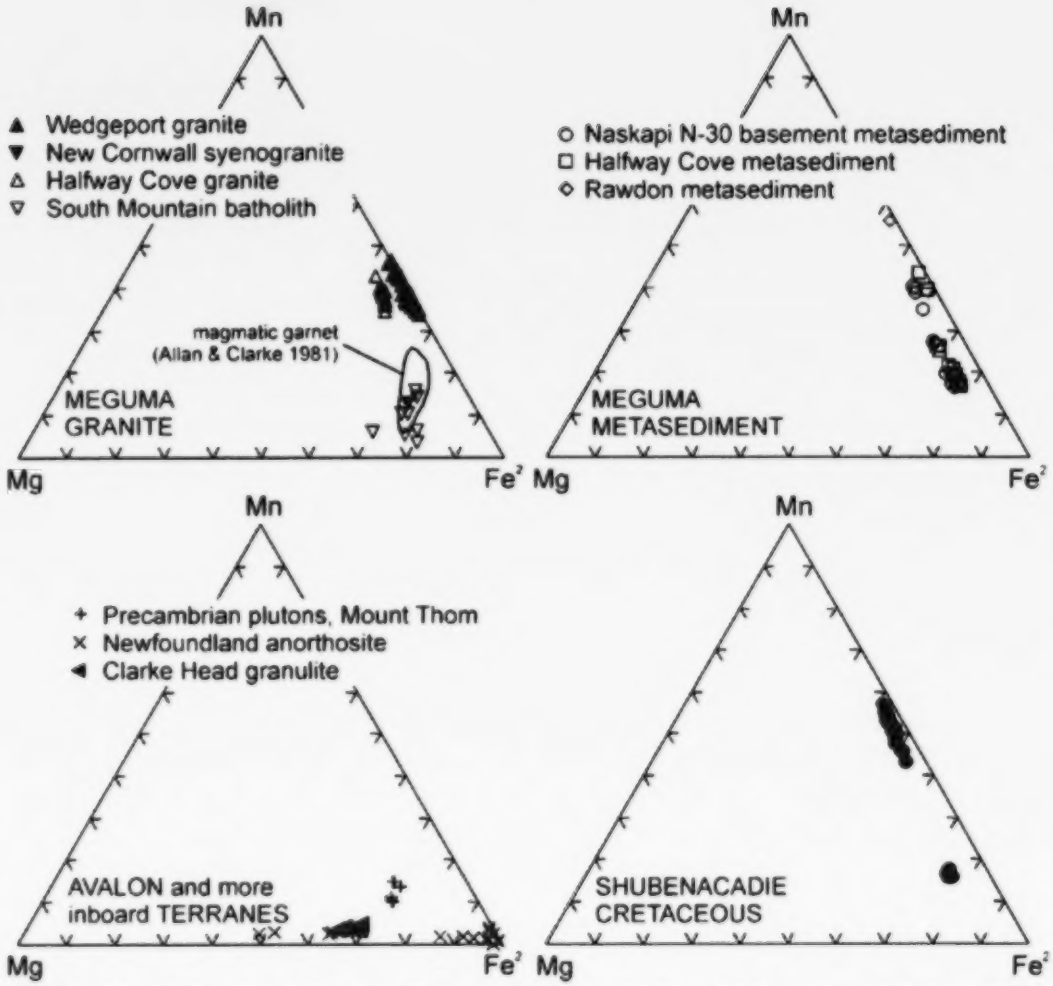
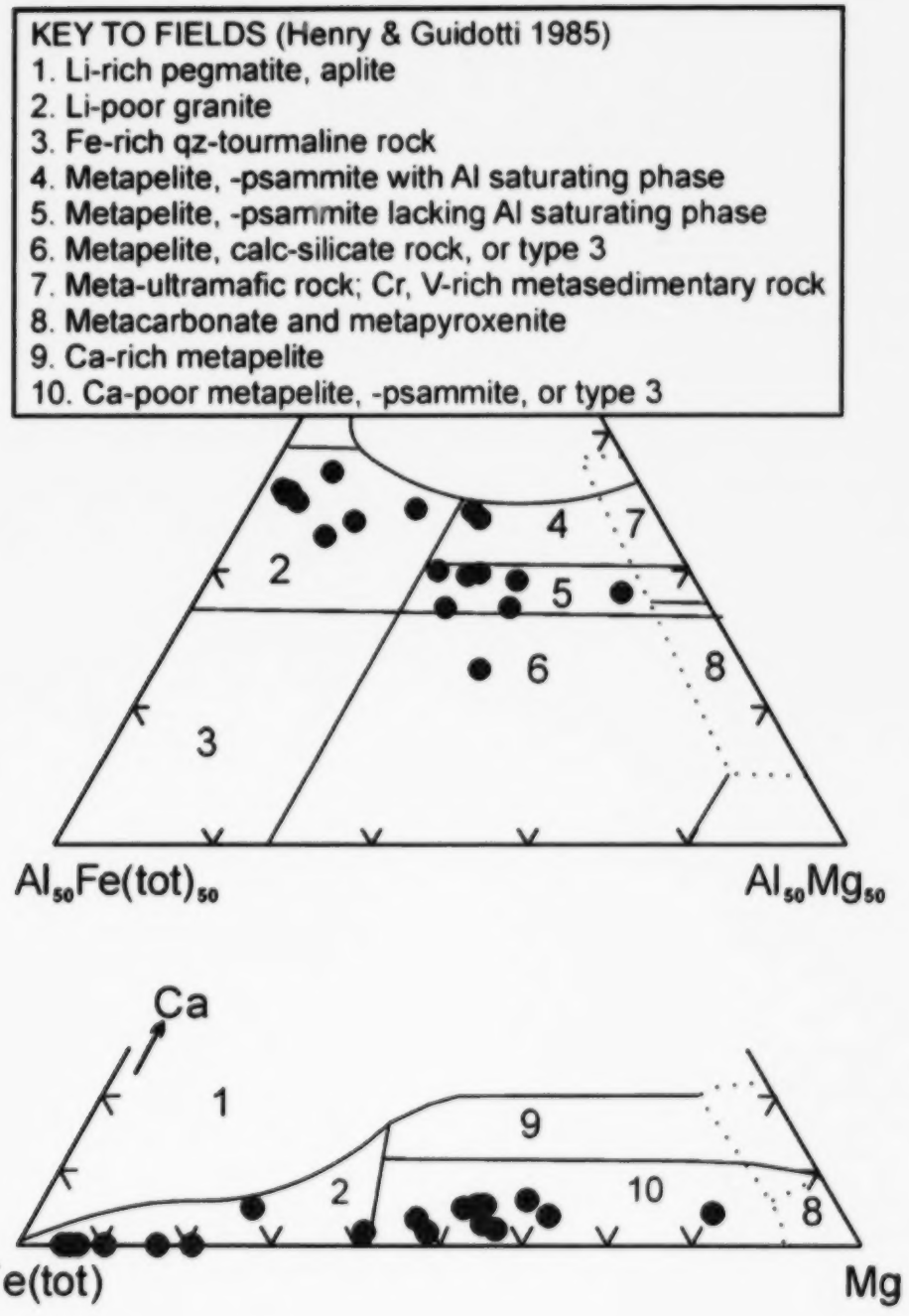


Figure 31. Chemical variation in garnet from Shubenacadie, compared with potential source areas. Sources of data noted in Table 9.



SHUBENACADIE

Figure 32. Chemical variation in tourmaline from Shubenacadie, compared with fields of Henry and Guidotti (1985).

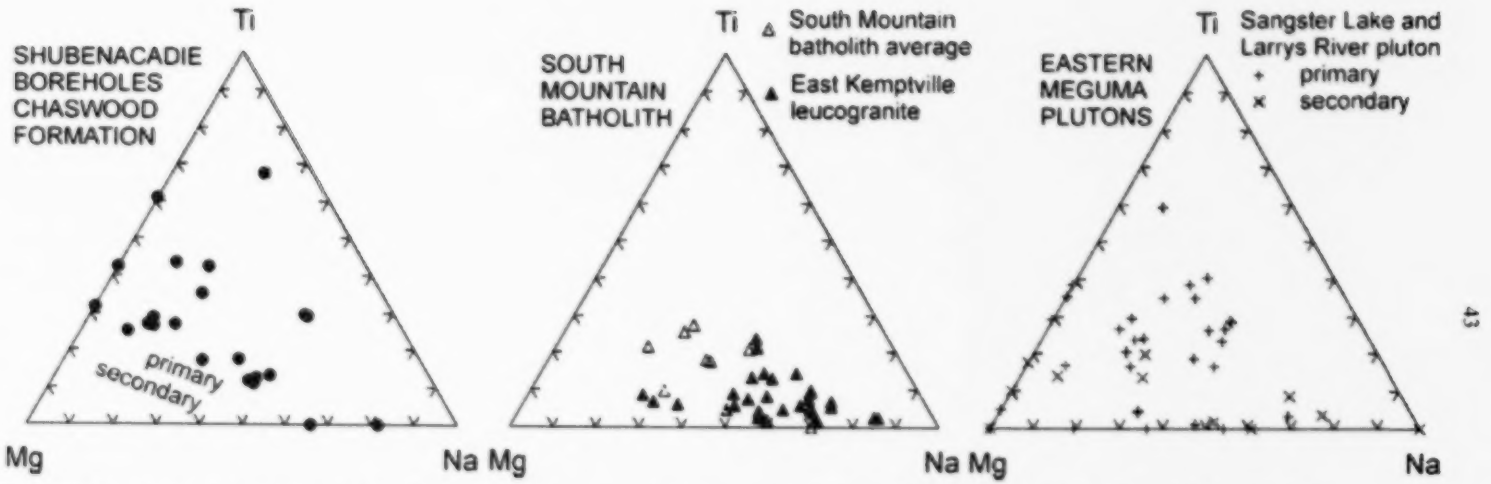


Figure 33. Chemical variation in muscovite from Shubenacadie, compared with potential source areas. Sources of data noted in Table 9. Primary and secondary fields from Miller *et al.* (1981).

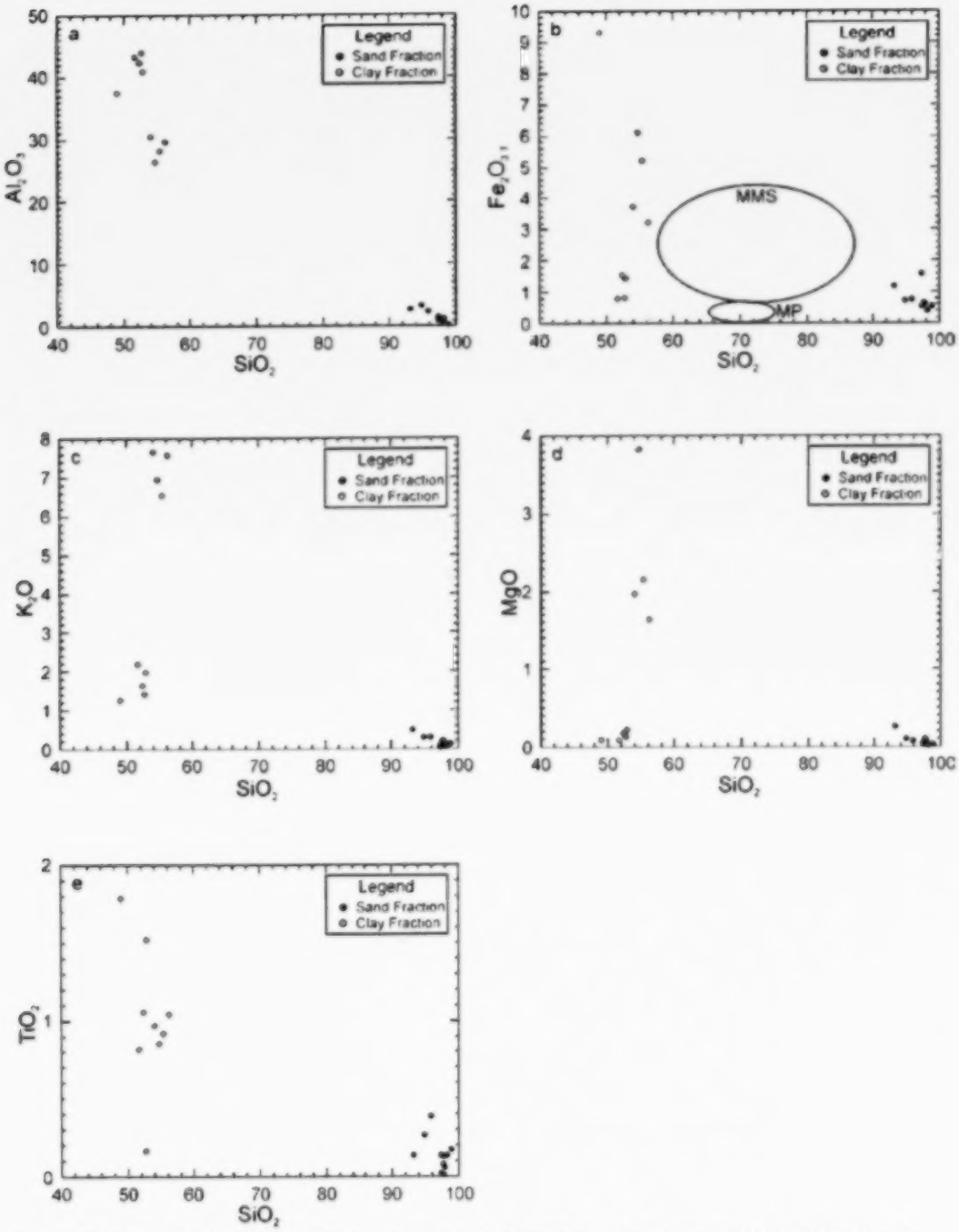


Figure 34. Selected major oxides (wt%) plotted agains SiO_2. Fields in b are from Murphy (2000). MMS= Meguma metasedimentary rocks; MP= Meguma granitoid plutons.

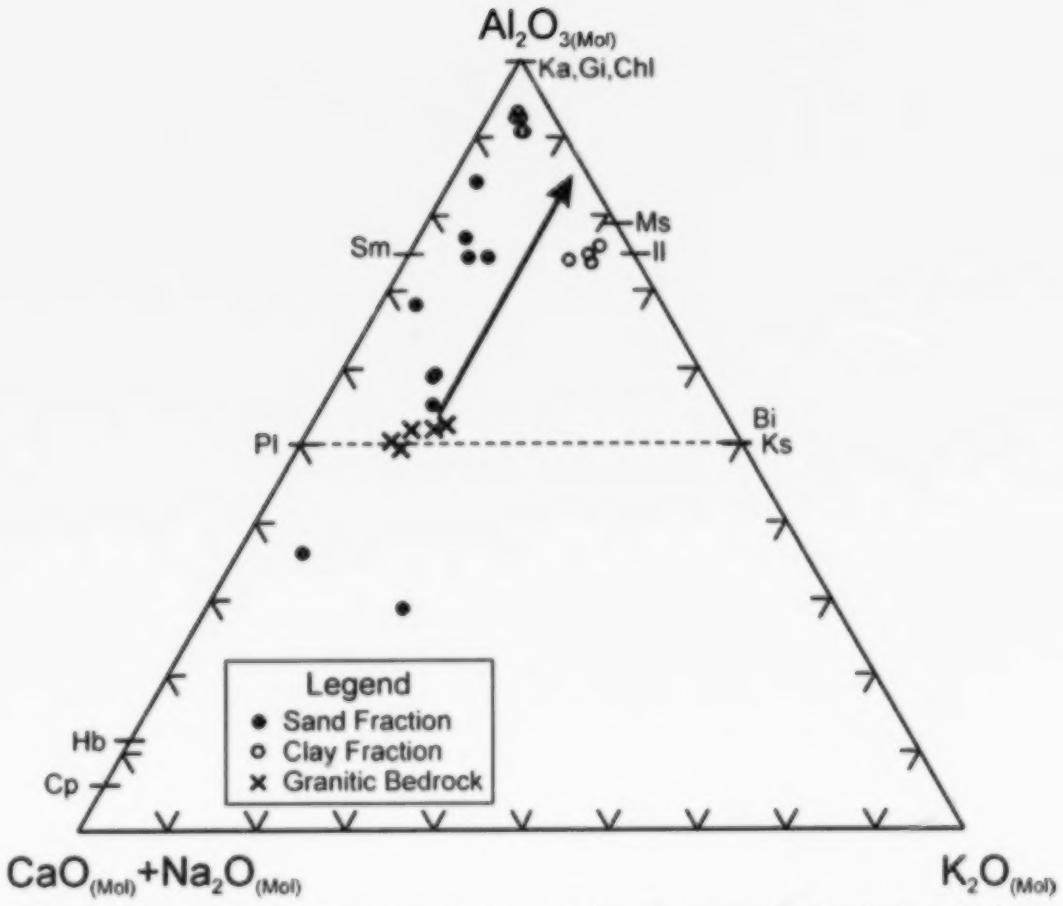


Figure 35. Al_2O_3 - $CaO+Na_2O$ - K_2O molar proportions diagram. Mineral compositions are from Nesbitt *et al.* (1996) and Murphy (2000). The weathering trend defined by analyses of samples from granitic bedrock is from Nesbitt et al (1996). Ka= kaolinite; Gi= gibbsite; Chl= chlorite; Il= illite; Ms=muscovite; Sm= smectite; Pl= plagioclase; Ks= K-feldspar; Hb= hornblende; Cp= clinopyroxene.

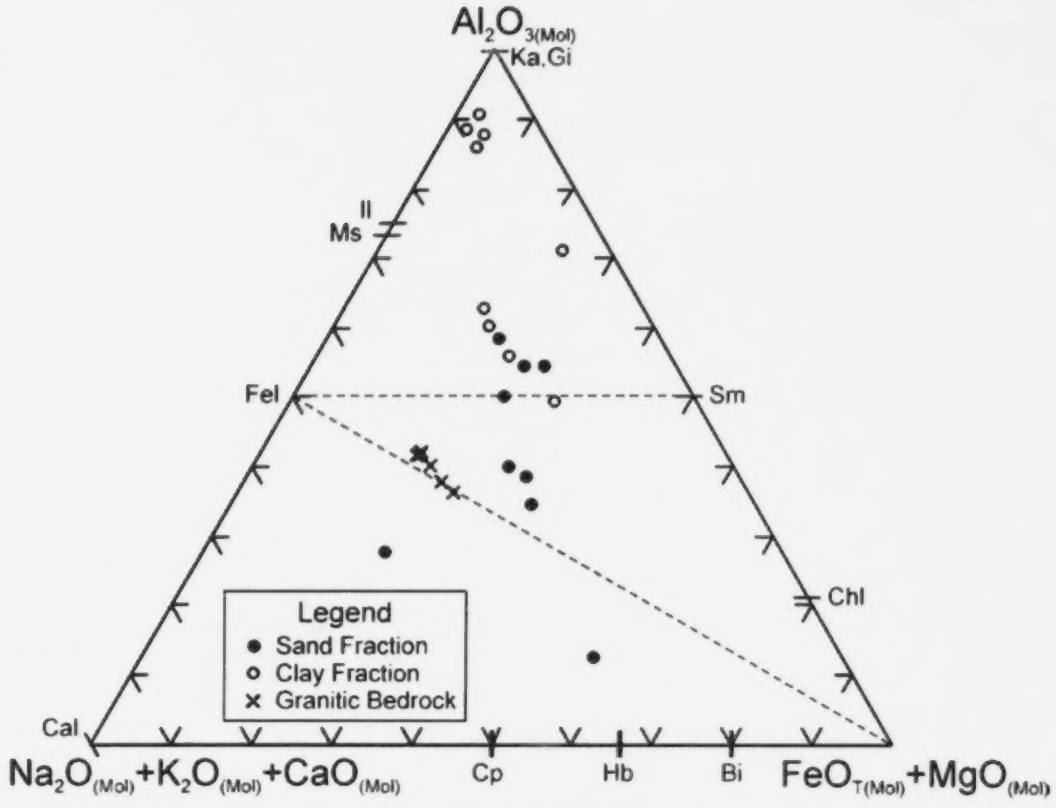


Figure 36. Al_2O_3 - Na_2O + K_2O + CaO - FeO_T + MgO molar proportions diagram. Mineral compositions are from Nesbitt *et al.* (1996) and Murphy (2000). The analyses for granitic bedrock is from Nesbitt *et al.* (1996). Ka= kaolinite; Gi= gibbsite; Sm= smectite; Il= illite; Ms= muscovite; Fel= feldspar; Bi= biotite; Cal= calcite.

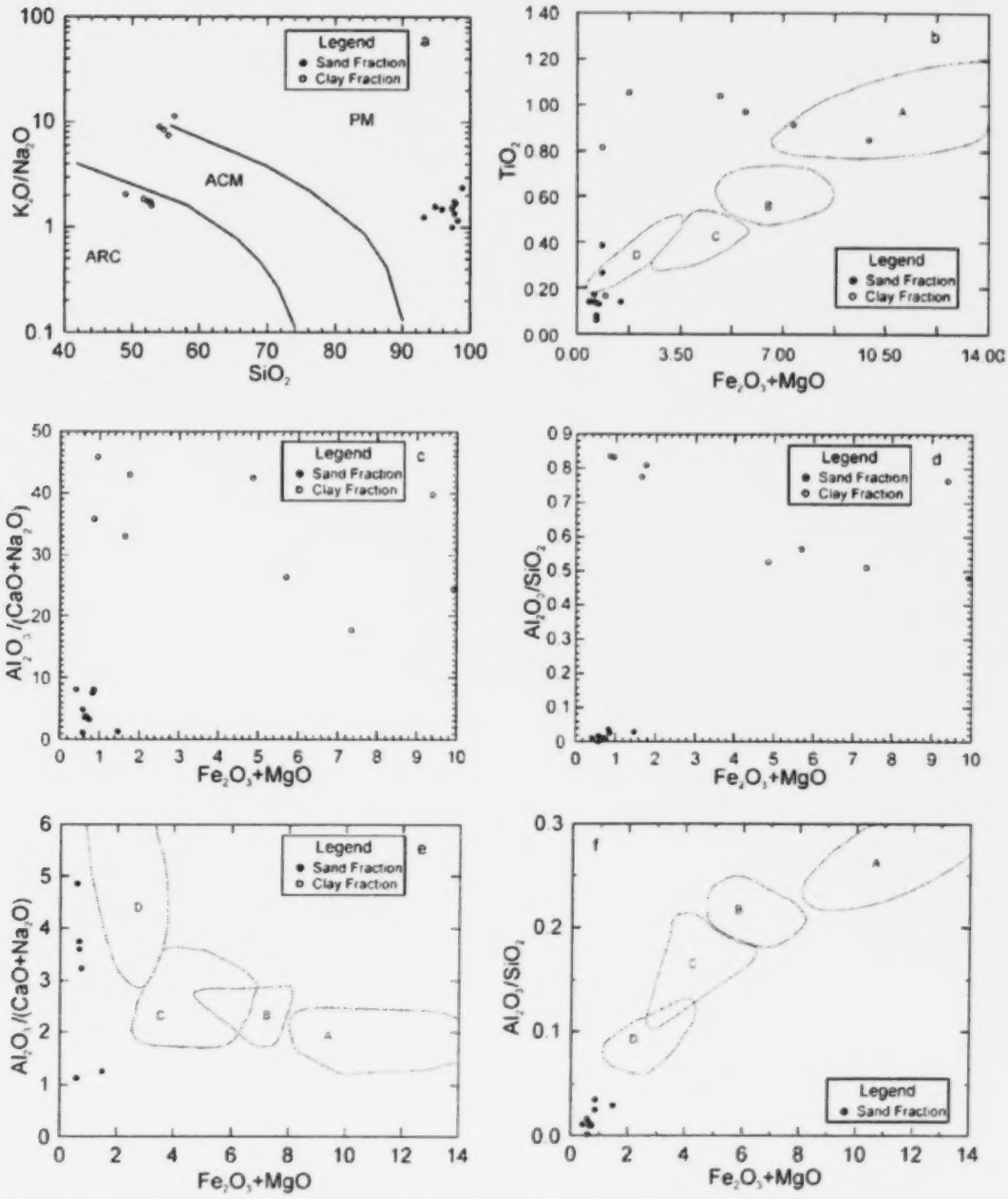


Figure 37. Shubenacadie outlier data plotted on chemical discrimination diagrams for determining sandstone sources. a: $\log K_2O/NaO_2$ vs. SiO_2 (from Roser and Korch,1986 as modified from Murphy 2000). ARC= volcanic arc; ACM= active continental margin; PM= passive margin. b: TiO_2 (wt%) vs. (Fe_2O_3 + MgO) (wt%). The fields A, B, C, D are from Bhatia (1983) (A= oceanic island arc; B= continental island arc; C= active continental margin; D= passive margin). The fields MMS (Meguma metasedimentary rocks) and MP (Meguma granitoid plutons) are from Murphy 2000). c: $Al_2O_3/(CaO + Na_2O)$ vs. (Fe_2O_3 + MgO) (wt%). d: Al_2O_3/SiO_2 vs. (Fe_2O_3 + MgO) (wt%). Names and sources for fields A, B, C, D, MMS and MP as in b. e: $Al_2O_3/(CaO + Na_2O)$ vs. (Fe_2O_3 + MgO) (wt%). Names and sources for fields A, B, C, D, MMS and MP as in b.

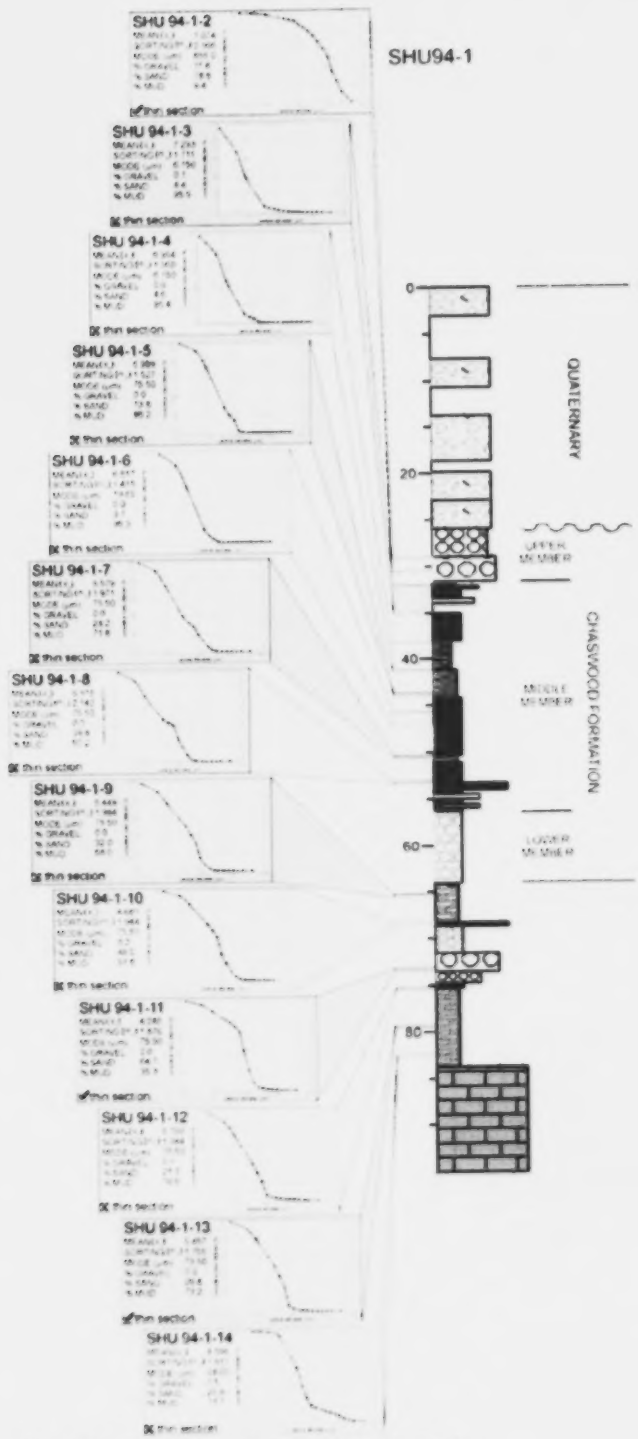


Figure 38. Grain size analyses, SHU94-1 borehole.

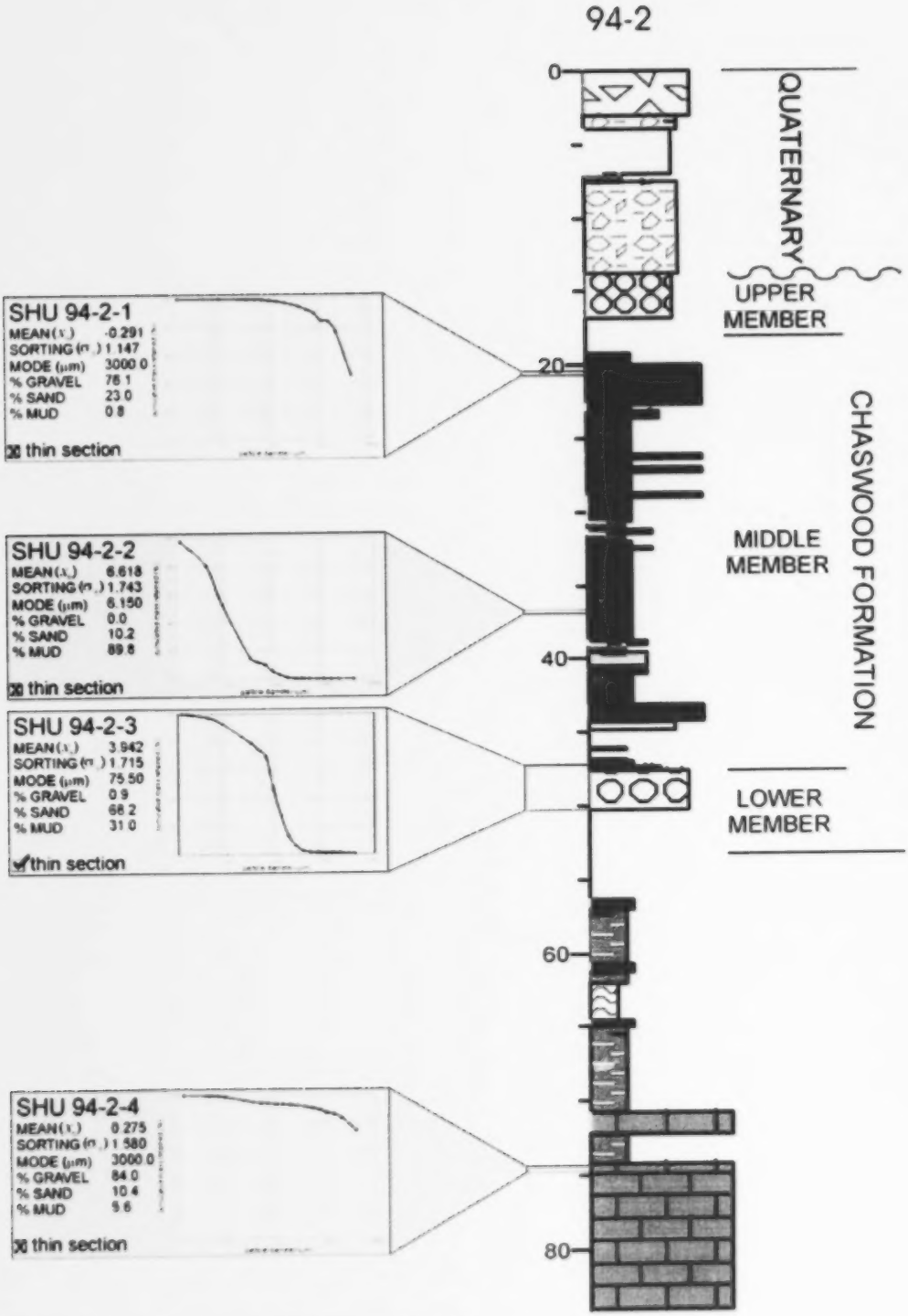


Figure 39. Grain size analyses from borehole SHU 94-2.

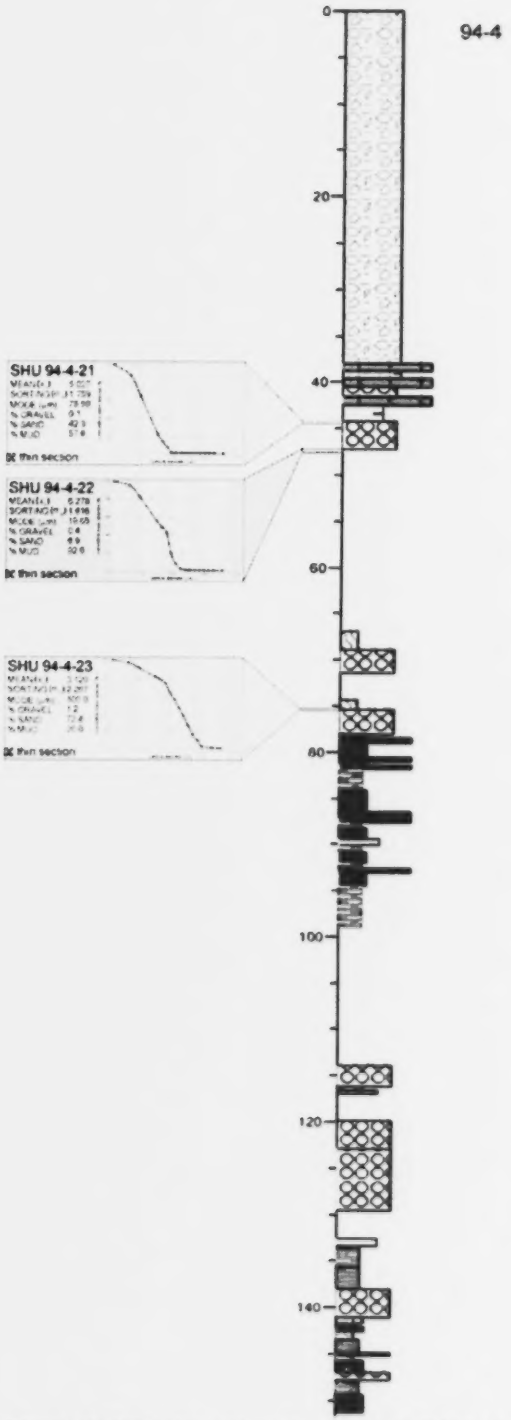


Figure 40. Grain size analyses from borehole SHU 94-4.

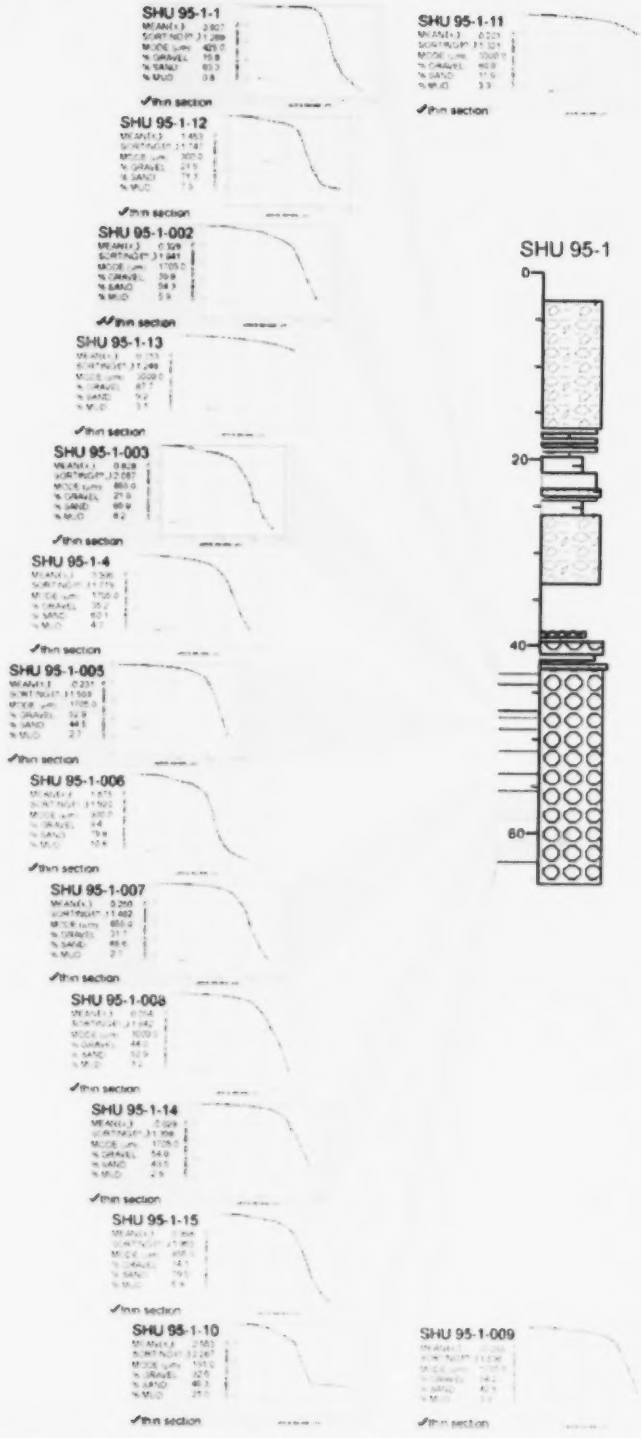


Figure 41. Grain size analyses from borehole SHU95-1.

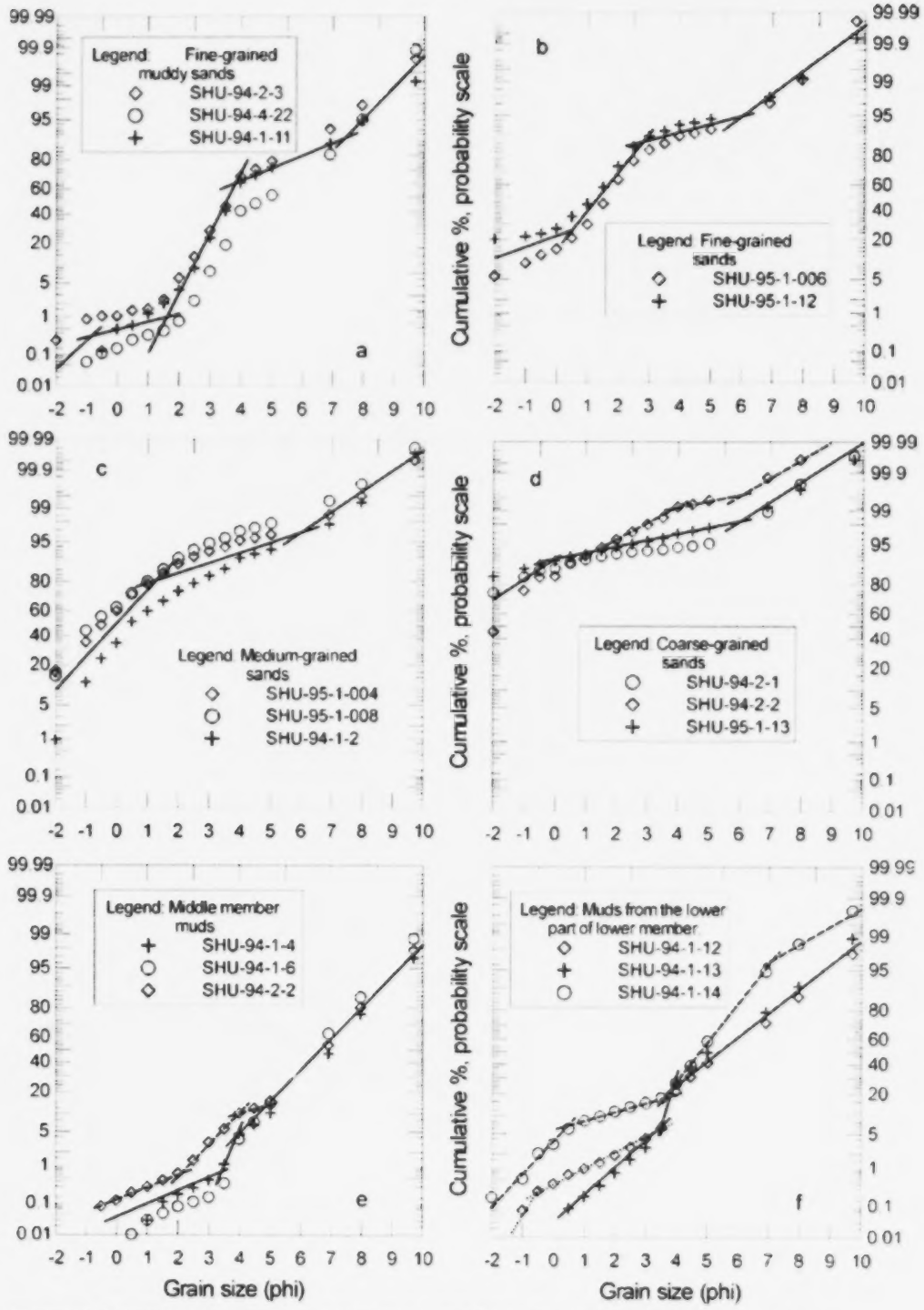


Figure 42. Selected grain size analyses plotted on probability scale and dissected into components.

Table 1. Petrography of heavy mineral fraction of sands.

sample	SHU 84-1-2		SHU 84-1-11		SHU 84-1-13		SHU 84-1-14		SHU 84-2-3		SHU 85-1-1		SHU 85-1-002		SHU 85-1-003		SHU 85-1-4		SHU 85-1-005	
depth (m)	29 - 30.5		73.2 - 73.5		79.3 - 79.6		82.3 - 82.6		47.2 - 82.3		39.4		40.9		44.4		45.4		46.9	
lithology	Silica Sand		Gray Sandy Clay		Light Gray Sandy Clay		Brown Clay		Light Gray Silty Sand		Coarse White Silica Sand		Silica Sand		Coarse White Silica Sand		Silica Sand		Coarse White Silica Sand	
overall % of heavy seperates	1.68		0.62		3.16		11.06		1.14		1.64		1.67		0.86		0.76		1.2	
	# points	%	# points	%	# points	%	# points	%	# points	%	# points	%	# points	%	# points	%	# points	%	# points	%
ilmenite + hematite1	12	3.2	0	0	0	0	2	0.5	32	7.9	3	0.8	12	3	0	0	12	3.3	6	1.6
hematite + ilmenite + goethite	24	6.6	13	3.3	46	11.8	4	1	22	5.4	10	2.6	48	12.2	23	6.1	10	2.8	20	5.3
ilmenite + rutile	6	2	30	7.6	2	0.5	0	0	16	3.7	22	5.6	12	3	15	3.4	16	4.1	7	1.8
rutile	0	0	5	1.3	0	0	0	0	2	0.5	3	0.8	16	4.1	5	1.3	3	0.8	2	0.5
pyrite	0	0	70	18.0	6	1.5	16	3.9	34	8.4	0	0	7	1.8	0	0	5	1.3	11	2.9
pyrite + ilmenite (rust)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.6	0	0	2	0.5
pyrite + hematite (rust)	0	0	0	0	44	10.6	35	7.9	5	1.2	0	0	7	1.8	28	6.8	10	2.6	23	6.1
ilmenite	3	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Magnetite (with ilmenite exsolution)	2	0.5	0	0	0	0	0	0	0	0	0	0	0	0	3	0.8	0	0	0	0
chalcopyrite	0	0	0	0	0	0	2	0.5	0	0	0	0	0	0	0	0	0	0	0	0
sphalerite	0	0	0	0	3	0.7	0	0	0	0	0	0	2	0.5	0	0	0	0	0	0
Ag metal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cu metal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pb (contemminant)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	0	0
Zn, Cu, Fe metaloid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	0	0	4	1.1
Fe metaloid	2	0.5	0	0	1	0.2	0	0	2	0.5	0	0	0	0	7	1.9	5	1.3	23	6.1
tourmaline	23	6.7	8	2.1	3	0.8	0	0	21	5.2	16	4.1	22	5.6	26	6.5	23	5.9	22	5.5
andalusite	1	0.2	0	0	0	0	0	0	0	0	0	0	2	0.5	2	0.5	0	0	0	0
topaz	3	0.7	0	0	0	0	0	0	0	0	0	0	2	0.5	0	0	3	0.8	1	0.3
garnet	7	1.8	0	0	0	0	0	0	0	0	0	0	3	0.8	6	1.6	1	0.3	0	0
staurolite	17	4.3	0	0	0	0	0	0	11	2.7	34	8.7	34	8.1	66	16	43	10.9	38	9.6
clinopyroxene	0	0	0	0	0	0	0	0	0	0	0	0	18	4.6	1	0.3	10	2.5	5	1.3
zircon	14	3.5	8	2	0	0	0	0	8	1.9	3	0.8	2	0.5	0	0	3	0.8	2	0.5
(edit+olac) hornblende	7	1.7	0	0	0	0	0	0	2	0.5	0	0	50	12.7	3	0.8	23	5.9	17	4.4
epidote	1	0.2	1	0.3	0	0	0	0	0	0	5	1.3	7	1.8	12	3.1	9	2.3	18	4.6
muscovite	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
orthopyroxene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
biotite	0	0	0	0	0	0	0	0	1	0.3	0	0	0	0	0	0	0	0	0	0
plagioclase	1	0.2	0	0	0	0	0	0	0	0	4	1	0	0	2	0.5	0	0	2	0.5
dolomite	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
quartz	12	3	61	15.4	16	3.8	2	0.5	41	10.1	10	2.5	9	2.3	8	2.1	14	3.5	9	2.4
lithic (ilm+hem+qz+-rt)	156	40.4	33	8.3	0	0	0	0	61	15.1	86	34.3	23	5.8	70	18.6	118	30.3	36	9.5
lithic (qz+py+ilm+-rt+hem)	0	0	16	4	0	0	9	2.4	7	1.7	0	0	3	0.8	6	1.6	13	3.3	7	1.8
lithic (qz+py)	0	0	84	21.3	3	0.7	51	13.4	46	11.4	0	0	1	0.3	0	0	0	0	8	2.1
lithic (ms+qz+py)	0	0	0	0	0	0	8	2.1	0	0	0	0	0	0	0	0	0	0	0	0
lithic (ms+hem)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (tur+ep+hem+ilm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (py+qz+hem)	0	0	14	3.5	206	49.3	65	16.7	30	7.4	0	0	4	1	0	0	3	0.8	3	0.8
lithic (tur+hem+py)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.8	0	0	0	0
lithic (hem+qz)	7	1.7	16	4.0	17	4.1	1	0.3	23	5.7	11	2.8	17	4.3	16	4.3	3	0.8	8	2.1
lithic (tur+qz)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (py+hem+ilm+-rt)	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (qz+ilm+st+zr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	18	4.6	0	0
lithic (qz+ä+zr+tur?opx)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3
lithic (dol+qz+py)	0	0	0	0	0	0	47	12.3	0	0	0	0	0	0	0	0	0	0	1	0.3
lithic (qz+py+cop+sh)	0	0	0	0	0	0	8	2.1	0	0	0	0	0	0	0	0	0	0	0	0
lithic (dol+qz+py+sh)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (rt+hem+dol+py)	0	0	0	0	0	0	75	19.2	0	0	0	0	0	0	0	0	0	0	0	0
lithic (dol+py)	0	0	0	0	0	0	2	0.5	0	0	0	0	0	0	0	0	0	0	0	0
lithic (cop+py+qz+dol+hem)	0	0	0	0	0	0	5	1.3	0	0	0	0	0	0	0	0	0	0	0	0
lithic (ms+qz+py+sph+cop)	0	0	0	0	0	0	2	0.5	0	0	0	0	0	0	0	0	0	0	0	0
lithic (qz+ilm+-rt)	4	1	0	0	0	0	1	0.3	0	0	0	0	0	0	0	0	0	0	0	0
lithic (tur+hem)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (qz+py+ms+hem)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (tur+ilm+-rt+hem+qz)	2	0.5	0	0	0	0	0	0	2	0.5	0	0	1	0.3	0	0	2	0.5	0	0
lithic (qz+ms+ilm+hem+-rt)	3	0.7	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	0	0	0	0
lithic (hem+py+sp)	0	0	0	0	0	0	0	0	1	0.3	152	38.0	2	0.5	0	0	0	0	0	0
lithic (qz+unkn oxide+unkn metal)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (W, Cu, Zn, Fe metals+ox+Cu)	0	0	0	0	1	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
unknown ind. Opaque xtalls	8	1.2	17	4.3	16	3.8	12	3.1	9	2.2	7	1.8	13	3.3	25	6.3	7	1.8	24	6.4
unknown metaloid	0	0	0	0	2	0.5	2	0.5	0	0	0	0	0	0	0	0	0	0	0	0
unknown ind transl. Xtalls	28	6.5	16	4	1	0.2	0	0	19	3.7	8	2	57	14.5	20	5.3	11	2.8	14	3.7
unknown lithic clasts	12	3	6	1.5	44	10.6	36	10	17	4.2	4	1	16	4.6	22	5.8	14	3.6	36	9.5
																			27	7.2
total	481	100	388	100	418	100	381	100	405	100	251	100	394	100	377	100	383	100	377	100
total opaques	68	16.2	140	36.4	121	29.1	65	17.1	119	29.4	45	11.6	117	29.7	65	24.4	64	16.3	95	25.2
total metalloids	2	0.5	0	0	3	0.7	2	0.5	2	0.5	0	0	0	0	9	2.3	0	0	0	0
total translucent minerals	111	27.7	86	24	18	4.3	9	2.4	97	24	80	20.5	199	49.7	180	47.4	143	36.4	186	41.1
total lithic clasts	223	55.9	161	40.7	274	65.9	305	80.1	187	46.2	299	68	77	19.3	116	30.9	199	43	89	22.8

Table 1. Petrography of heavy mineral fraction of sands (cont'd).

sample	SHU 95-1-006		SHU 95-1-007		SHU 95-1-008		SHU 95-1-009		SHU 95-1-10		SHU 95-1-11		SHU 95-1-12		SHU 95-1-13		SHU 95-1-14		SHU 95-1-15	
depth (m)	49.9		52.9		55.3		64.9		61.9 - 64.9		34.4 - 34.9		40.4 - 41.0		44.0 - 44.4		85.9 - 86.9		58.9 - 61.9	
lithology	Medium Silica Sand		Coarse Silica Sand		Coarse Silica Sand		Coarse Silica Sand		Limonitic Silica Sand		Limonitic Silica Sand		Limonitic Silica Sand		Limonitic Silica Sand		Limonitic Silica Sand		Limonitic Silica Sand	
overall % of heavy separate	0.72		0.68		1.48		4.22		1.08		10.12		1.77		3.1		1.19		1.83	
	# points	%	# points	%	# points	%	# points	%	# points	%	# points	%	# points	%	# points	%	# points	%	# points	%
ilmenite + hematite1	3	0.7	19	4.8	24	5.9	17	4.3	7	1.8	10	2.5	18	4.6	8	1.9	37	9.3	9	2.1
hematite + limonite + goethite	18	3.7	36	8.8	25	6.1	89	22.2	24	6.0	14	3.5	33	8.2	46	11.3	36	8.8	21	5
ilmenite + rutile	37	8.6	7	1.8	13	3	32	8	21	5.1	7	1.7	19	4.7	13	3.3	11	2.8	13	3.1
rutile	18	3.7	4	1	4	1	11	2.8	18	4.5	4	1	5	1.2	3	0.8	2	0.5	3	0.7
pyrite	1	0.2	0	0	7	1.7	0	0	0	0	36	8.9	3	0.8	1	0.3	3	0.8	23	5.5
pyrite + ilmenite (xtall)	0	0	0	0	0	0	0	0	0	0	4	1	0	0	1	0.3	0	0	9	2.1
pyrite + hematite (xtall)	0	0	0	0	16	3.7	7	1.8	0	0	1	0.2	0	0	6	1.5	3	0.8	7	1.7
ilmenite	0	0	3	0.8	0	0	0	0	0	0	3	0.7	0	0	2	0.5	3	0.8	3	0.8
Magnetite (with ilmenite exsolution)	0	0	0	0	0	0	0	0	0	0	3	0.7	0	0	2	0.5	3	0.8	0	0
chalcopyrite	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sphalerite	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ag metal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2
Cu metal	2	0.5	0	0	0	0	0	0	1	0.3	0	0	0	0	0	0	0	0	8	1.9
Pb (contaminant)	0	0	0	0	0	0	0	0	3	0.8	0	0	0	0	0	0	0	0	0	0
Zn, Cu, Fe metaloid	0	0	0	0	11	2.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fe metaloid	0	0	0	0	13	3.2	0	0	0	0	3	0.7	0	0	0	0	1	0.3	7	1.7
tourmaline	43	10.5	29	7	26	6.4	18	4.5	20	5.2	44	11.2	16	4.1	14	3.5	21	5.3	46	11
andalusite	1	0.2	4	1	0	0	0	0	0	0	1	0.2	0	0	0	0	2	0.5	0	0
topaz	3	0.7	0	0	0	0	0	0	0	0	2	0.5	0	0	0	0	2	0.5	3	0.7
garnet	3	0.7	0	0	1	0.2	0	0	1	0.3	3	0.7	2	0.5	3	0.8	0	0	4	1
staurolite	34	8.3	40	10	22	5.5	10	2.5	9	2.3	17	4.3	44	10.9	13	3.3	43	10.9	36	8.6
clinopyroxene	0	0	0	0	7	1.7	0	0	0	0	26	6.2	16	3.7	10	2.5	0	0	8	1.9
zircon	18	3.7	10	2.5	2	0.5	1	0.3	3	0.8	3	0.7	0	0	9	2.3	2	0.5	6	1.4
(actinolite) hornblende	2	0.5	0	0	7	1.7	0	0	0	0	13	3.2	13	3.2	58	14.6	0	0	17	4.1
epidote	7	1.7	3	0.8	2	0.5	0	0	3	0.8	21	5.2	26	6.5	91	22.9	1	0.3	6	1.4
muscovite	0	0	0	0	0	0	0	0	2	0.5	0	0	0	0	1	0.3	1	0.3	1	0.2
orthopyroxene	0	0	0	0	0	0	0	0	0	0	3	0.8	0	0	0	0	1	0.3	0	0
biotite	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	1	0.3	0	0	0	0
plagioclase	2	0.5	0	0	0	0	0	0	0	0	0	0	0	0	3	0.8	0	0	0	0
dolomite	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
quartz	6	1	18	4.5	8	2	22	5.5	32	8.3	32	8.5	11	2.7	12	3	10	2.5	14	3.6
lithic (ilm+hem+qz+-rt)	188	28.4	169	42.4	118	29.6	122	30.7	156	40.6	4	1	120	29.9	9	2.3	140	36.2	31	7.4
lithic (qz+py+ilm+-rt+hem)	0	0	0	0	0	0	2	0.5	5	1.3	10	2.5	0	0	4	1	3	0.8	5	1.2
lithic (qz+py)	2	0.5	0	0	5	1.2	0	0	0	0	36	9.4	2	0.5	0	0	1	0.3	4	1
lithic (ms+qz+py)	0	0	0	0	0	0	0	0	0	0	1	0.2	0	0	0	0	0	0	0	0
lithic (ms+hem)	0	0	0	0	0	0	0	0	0	0	1	0.2	0	0	0	0	0	0	0	0
lithic (tur+ep+hem+ilm)	0	0	0	0	0	0	0	0	0	0	1	0.2	0	0	0	0	0	0	0	0
lithic (py+qz+hem)	0	0	0	0	7	1.7	0	0	0	0	1	0.2	1	0.2	0	0	7	1.8	0	0
lithic (tur+hem+py)	0	0	0	0	0	0	0	0	0	0	3	0.7	0	0	0	0	0	0	0	0
lithic (hem+qz)	16	3.9	14	3.5	10	2.5	15	3.8	10	2.6	3	0.7	10	2.5	7	1.8	13	3.3	0	0
lithic (tur+qz)	0	0	0	0	0	0	0	0	0	0	1	0.2	0	0	0	0	0	0	0	0
lithic (py+hem+ilm+rt)	0	0	0	0	0	0	0	0	0	0	0	0	3	0.7	0	0	0	0	0	0
lithic (qz+ilm+rt+zr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (qz+ti+zr+tur+?opx)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (dol+qz+py)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (qz+py+ccp+ilm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (dol+qz+py+ilm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (rt+hem+dol+py)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (dol+py)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (ccp+py+qz+dol+hem)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (ms+qz+py+sph+ccp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (qz+ilm+-rt)	0	0	0	0	13	3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (tur+hem)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (qz+py+ms+hem)	0	0	0	0	0	0	0	0	2	0.5	0	0	0	0	2	0.5	0	0	0	0
lithic (tur+ilm+-rt+hem+qz)	0	0	0	0	0	0	1	0.3	0	0	1	0.3	0	0	0	0	2	0.5	1	0.2
lithic (qz+ms+ilm+hem+-rt)	77	18.8	0	0	0	0	30	7.5	32	8.3	0	0	1	0.3	0	0	0	0	0	0
lithic (hem+py+ep)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lithic (qz+unkn oxide+unkn metal)	0	0	0	0	0	0	1	0.3	0	0	0	0	0	0	1	0.3	0	0	0	0
lithic (W, Cu, Zn, Fe metals+ct+Qz)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
unknown ind. Opaque xtalls	6	1.5	14	3.5	15	3.7	9	2.3	10	2.6	29	6.5	8	2	15	3.8	30	7.5	37	8.8
unknown metaloid	4	1	2	0.5	14	3.4	3	0.8	10	2.6	1	0.2	3	0.7	19	5.5	9	2.3	7	1.7
unknown ind transl. Xtalls	6	2	7	1.8	9	2.2	9	2	10	2.6	37	9.2	15	3.7	32	8	4	1	38	9.1
unknown lithic clasts	7	1.7	15	3.8	32	7.8	3	0.8	6	1.6	43	10.7	10	2.5	7	1.8	16	4.8	41	9.8
total	409	100	399	100	408	100	398	100	384	100	403	100	402	100	399	100	389	100	419	100
total opaques	67	16.4	81	20.3	100	24.5	169	42.5	80	20.8	101	25.1	95	23.6	104	26.1	117	29.4	130	31
total metalloids	6	1.5	2	0.5	38	9.4	3	0.8	13	3.4	4	1	3	0.7	19	3.8	10	2.6	23	5.5
total translucent minerals	126	30.8	118	29.6	65	20.9	56	14.1	80	20.8	101	47.4	157	39.1	247	62.1	87	21.9	181	43.2
total lithic clasts	210	51.3	198	49.6	183	49.1	170	42.7	211	54.9	107	26.6	147	36.6	32	8	185	46.5	86	20.5

Table 2a. Summary of the % distribution of translucent minerals.

	95-1-11	95-1-1	95-1-12	95-1-2	95-1-13	95-1-3	95-1-4	95-1-5	95-1-6	95-1-7	95-1-8	95-1-14	95-1-15	95-1-10	95-1-9
Depth (m)	34.4 - 34.9	39.4	40.4 - 41.0	40.9	44.0 - 44.4	44.4	45.4	46.9	49.9	52.9	55.3	55.9 - 58.9	58.9 - 61.9	61.9 - 64.9	64.9
Mode (μm)	3000.0	425.0	300.0	1705.0	3000.0	855.0	1705.0	1705.0	300.0	855.0	3000.0	1705.0	855.0	151.0	1705.0
Tourmaline	34.1	25.8	13.7	16.9	6.9	27.1	20.2	29.1	39.1	30.1	38.2	29.2	36.5	55.6	57.7
Andalusite	0.8			1.5		1.6			0.9	4.3		2.8			
Topaz	1.5			1.5			2.6	0.9	2.7			2.8	2.4		
Garnet	2.3		1.5	2.3	1.0	4.7	0.9		2.7		1.5		3.2	2.8	
Staurolite	12.9	54.8	33.6	18.5	6.4	52.7	37.7	30.0	30.9	51.6	33.8	59.7	28.6	25.0	38.5
Zircon	2.3	4.8		1.5	4.5		2.6	1.8	13.6	10.8	2.9	2.8	4.8	8.3	3.9
Unst[1]	46.2	14.5	51.1	57.7	81.2	14.0	36.0	38.2	10.0	3.2	23.5	2.8	24.6	8.3	
Total	100.1	99.9	99.9	99.9	100.0	100.1	100.0	100.0	99.9	100.0	99.9	100.1	100.1	100.0	100.1

	94-1-2	94-1-11	94-1-13	94-1-14
Depth (m)	29.0 - 30.5	73.2 -73.5	79.3 - 79.6	82.3 - 82.6
Mode (μm)	855	75.5	75.5	38
Tourmaline	31.5	50.0	100.0	
Andalusite	1.4			
Topaz	41.0			
Garnet	8.2			
Staurolite	23.3			
Zircon	19.2	44.4		
Unst[1]	12.3	5.6		
Total	100.0	100.0	100.0	0.0

1 - Unstable Minerals: feldspar + pyroxene + amphibole + epidote + biotite

Table 2b. Summary of the % distribution of heavy minerals and heavy lithic clasts.

	95-1-11	95-1-1	95-1-12	95-1-2	95-1-13	95-1-3	95-1-4	95-1-5	95-1-6	95-1-7	95-1-8	95-1-14	95-1-15	95-1-10	95-1-9
Depth (m)	34.4 - 34.9	39.4	40.4 - 41.0	40.9	44.0 - 44.4	44.4	45.4	46.9	49.9	52.9	55.3	55.9 - 58.9	58.9 - 61.9	61.9 - 64.9	64.9
Mode µm)	3000.0	425.0	300.0	1705.0	3000.0	855.0	1705.0	1705.0	300.0	855.0	3000.0	1705.0	855.0	151.0	1705.0
Opaques Total	25.1	11.5	23.6	29.7	26.1	24.4	16.3	25.2	16.4	20.3	24.6	29.4	31.0	20.8	42.5
Metalloids Total	1.0	0.0	0.7	2.3	3.8	2.4	4.3	10.9	1.5	0.5	9.4	2.5	5.5	3.4	0.8
Translucent Minerals Total	47.4	20.5	39.1	49.7	82.1	42.4	36.4	41.1	30.8	29.6	20.9	21.9	43.2	20.8	14.1
Lithic Clasts Total	26.6	68.0	36.6	18.3	8.0	30.8	43.0	22.8	51.3	49.6	45.1	46.2	20.3	54.9	42.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

	94-1-2	94-1-11	94-1-13	94-1-14
Depth (m)	29.0 - 30.5	73.2 -73.5	79.3 - 79.6	82.3 - 82.6
Mode µm)	855	75.5	75.5	38
Opaques Total	16.2	35.4	29.1	17.1
Metalloids Total	0.5	0.0	0.7	0.5
Translucent Minerals Total	27.7	24.0	4.3	2.4
Lithic Clasts Total	55.6	40.7	65.9	80.1
Total	100.0	100.0	100.0	100.0

Table 3. Electron microprobe chemical analyses of silicate minerals.

File	Sample No.	Analysis No.	Min'l	Locality	Pos'n	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	Cr_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	Total
190	95-1-15	1	Grt	Shubenacadie boreholes	Rim	38.52	0.00	20.85	0.00	0.00	22.40	18.12	0.98	2.04	0.00	0.00	100.81
191	95-1-15	2	Grt	Shubenacadie boreholes	Rim	38.49	0.00	20.78	0.00	0.00	21.75	19.43	0.84	2.20	0.00	0.00	101.49
192	95-1-15	3	Grt	Shubenacadie boreholes	Rim	38.07	0.00	20.58	0.00	0.00	20.51	20.66	0.87	2.42	0.00	0.00	101.13
193	95-1-15	4	Grt	Shubenacadie boreholes	Rim	38.29	0.00	20.58	0.00	0.00	19.66	21.13	0.78	2.58	0.00	0.00	100.99
194	95-1-15	5	Grt	Shubenacadie boreholes	Rim	38.32	0.00	20.38	0.00	0.00	18.03	21.27	0.73	3.30	0.00	0.00	100.03
195	95-1-15	6	Grt	Shubenacadie boreholes	Rim	38.02	0.00	20.41	0.00	0.00	17.79	21.66	0.66	3.44	0.00	0.00	100.00
196	95-1-15	7	Grt	Shubenacadie boreholes	Rim	38.21	0.00	20.73	0.00	0.00	17.84	21.32	0.71	4.97	0.00	0.00	101.58
197	95-1-15	8	Grt	Shubenacadie boreholes	Rim	35.98	0.00	20.60	0.00	0.00	18.81	21.66	0.66	2.40	0.00	0.00	100.13
198	95-1-15	9	Grt	Shubenacadie boreholes	Rim	38.47	0.00	20.58	0.00	0.00	19.86	21.03	0.75	2.65	0.00	0.00	101.33
199	95-1-15	10	Grt	Shubenacadie boreholes	Rim	38.38	0.00	20.69	0.00	0.00	20.01	20.01	0.95	2.43	0.00	0.00	101.02
200	95-1-15	11	Grt	Shubenacadie boreholes	Rim	38.37	0.00	20.63	0.00	0.00	21.42	19.26	0.85	2.29	0.00	0.00	100.82
201	95-1-15	12	Grt	Shubenacadie boreholes	Rim	38.54	0.00	20.80	0.00	0.00	22.98	18.48	0.95	2.07	0.00	0.00	101.49
202	95-1-15	13	Grt	Shubenacadie boreholes	Rim	38.25	0.00	20.63	0.00	0.00	18.61	19.33	0.59	5.05	0.00	0.00	100.46
203	95-1-15	14	Grt	Shubenacadie boreholes	Rim	38.46	0.00	20.81	0.00	0.00	17.82	20.50	0.58	4.85	0.00	0.00	100.82
204	95-1-15	15	Grt	Shubenacadie boreholes	Rim	38.50	0.00	20.74	0.00	0.00	18.96	21.53	0.48	4.71	0.00	0.00	100.91
205	95-1-15	16	Grt	Shubenacadie boreholes	Rim	38.13	0.00	20.77	0.00	0.00	18.53	21.86	0.43	4.28	0.00	0.00	100.00
206	95-1-15	17	Grt	Shubenacadie boreholes	Rim	38.42	0.00	20.83	0.00	0.00	18.24	22.18	0.44	4.44	0.00	0.00	100.55
207	95-1-15	18	Grt	Shubenacadie boreholes	Rim	38.28	0.00	20.41	0.00	0.00	18.31	21.74	0.46	4.18	0.00	0.00	99.38
208	95-1-15	19	Grt	Shubenacadie boreholes	Rim	35.97	0.00	20.57	0.00	0.00	18.38	21.15	0.51	4.90	0.00	0.00	99.48
209	95-1-15	20	Grt	Shubenacadie boreholes	Rim	38.47	0.00	21.02	0.00	0.00	18.98	21.16	0.54	4.86	0.00	0.00	101.00
210	95-1-15	21	Grt	Shubenacadie boreholes	Rim	35.84	0.00	20.25	0.00	0.00	18.72	20.71	0.48	8.48	0.00	0.00	100.48
211	95-1-15	22	Grt	Shubenacadie boreholes	Rim	38.13	0.00	20.51	0.00	0.00	17.71	19.83	0.54	4.81	0.00	0.00	99.63
212	95-1-11	1	Grt	Shubenacadie boreholes	Rim	38.28	0.00	20.91	0.00	0.00	31.22	7.28	1.85	1.06	0.00	0.00	98.60
214	95-1-11	3	Grt	Shubenacadie boreholes	Rim	38.21	0.00	20.44	0.00	0.00	31.38	6.96	2.06	1.10	0.00	0.00	98.14
215	95-1-11	4	Grt	Shubenacadie boreholes	Rim	38.14	0.00	20.82	0.00	0.00	31.14	6.87	1.97	1.10	0.00	0.00	98.04
216	95-1-11	5	Grt	Shubenacadie boreholes	Rim	38.88	0.00	20.94	0.00	0.00	32.14	7.01	2.01	1.05	0.00	0.00	100.01
217	95-1-11	6	Grt	Shubenacadie boreholes	Rim	38.22	0.00	20.72	0.00	0.00	31.81	6.57	1.99	1.11	0.00	0.00	98.42
218	95-1-11	7	Grt	Shubenacadie boreholes	Rim	38.73	0.00	21.20	0.00	0.00	31.83	6.91	2.21	1.12	0.00	0.00	100.00
219	95-1-11	8	Grt	Shubenacadie boreholes	Rim	38.69	0.00	21.09	0.00	0.00	32.18	6.74	2.19	1.11	0.00	0.00	100.00
220	95-1-11	9	Grt	Shubenacadie boreholes	Rim	38.72	0.00	21.03	0.00	0.00	32.43	6.69	1.99	1.12	0.00	0.00	99.98
221	95-1-11	10	Grt	Shubenacadie boreholes	Rim	38.34	0.00	20.99	0.00	0.00	31.97	6.71	1.97	1.13	0.00	0.00	98.71
222	95-1-11	11	Grt	Shubenacadie boreholes	Rim	38.80	0.00	21.10	0.00	0.00	32.08	6.87	2.04	1.14	0.00	0.00	100.00
223	95-1-11	12	Grt	Shubenacadie boreholes	Rim	38.66	0.00	21.08	0.00	0.00	32.29	6.77	2.10	1.12	0.00	0.00	100.00
224	95-1-11	13	Grt	Shubenacadie boreholes		37.08	0.00	20.89	0.00	0.00	32.71	6.63	1.97	1.24	0.00	0.00	100.52
225	95-1-15	36	Grt	Shubenacadie boreholes		38.35	0.00	20.53	0.00	0.00	17.99	19.62	0.53	4.98	0.00	0.00	100.00
226	95-1-15	37	Grt	Shubenacadie boreholes		38.41	0.00	20.32	0.00	0.00	17.90	21.30	0.58	3.49	0.00	0.00	100.00
227	95-1-2	1	Ms	Shubenacadie boreholes		49.28	1.05	33.73	0.00	0.00	1.76	0.00	1.27	0.00	0.94	8.07	96.09
228	95-1-2	2	Ms	Shubenacadie boreholes		50.08	1.48	34.02	0.00	0.00	1.14	0.00	0.52	0.00	0.98	6.94	95.10
229	95-1-2	3	Ms	Shubenacadie boreholes		48.53	1.84	36.19	0.00	0.00	1.36	0.00	0.67	0.00	1.11	7.50	94.90
230	95-1-2	4	Ms	Shubenacadie boreholes		40.14	7.09	31.25	0.00	0.00	3.19	0.00	0.80	0.18	0.87	6.63	89.93
231	95-1-2	5	Ms	Shubenacadie boreholes		42.77	1.98	30.29	0.00	0.00	2.94	0.00	1.35	0.00	0.00	8.08	87.38
232	95-1-2	6	Ms	Shubenacadie boreholes		47.65	1.54	31.89	0.00	0.00	3.09	0.00	1.52	0.00	0.32	8.90	94.85
233	95-1-2	7	Ms	Shubenacadie boreholes		44.52	2.45	30.81	0.00	0.00	4.55	0.00	1.23	0.00	0.29	8.58	92.40
234	95-1-2	8	Ms	Shubenacadie boreholes		48.13	1.48	31.54	0.00	0.00	3.20	0.00	1.62	0.00	0.31	8.82	95.10
235	95-1-2	9	Ms	Shubenacadie boreholes		47.74	1.32	31.15	0.00	0.00	2.98	0.00	1.88	0.00	0.22	7.92	93.01
236	95-1-2	10	Ms	Shubenacadie boreholes		48.11	1.37	31.56	0.00	0.00	2.97	0.00	1.49	0.00	0.00	7.73	93.23
237	95-1-10	1	Ms	Shubenacadie boreholes		47.05	0.00	38.63	0.00	0.00	2.47	0.00	0.54	0.00	0.90	8.73	98.22
238	95-1-10	2	Ms	Shubenacadie boreholes		48.21	0.49	36.90	0.00	0.00	2.28	0.00	0.78	0.00	0.70	8.75	97.11
239	95-1-10	3	Ms	Shubenacadie boreholes		46.54	0.48	34.51	0.00	0.00	2.56	0.00	0.86	0.00	0.67	7.86	93.24
240	95-1-10	4	Ms	Shubenacadie boreholes		48.38	0.79	32.43	0.00	0.00	3.02	0.00	1.19	0.00	0.58	8.13	94.49
241	95-1-10	5	Ms	Shubenacadie boreholes		50.79	1.41	33.21	0.00	0.00	2.17	0.00	1.52	0.00	0.33	8.01	97.44
242	95-1-10	6	Ms	Shubenacadie boreholes		45.51	2.58	29.30	0.00	0.00	4.21	0.00	1.53	0.00	0.66	7.54	91.33
243	95-1-10	7	Ms	Shubenacadie boreholes		45.72	4.20	29.58	0.00	0.00	2.83	0.00	1.38	0.00	0.00	8.32	91.81
244	95-1-10	8	Ms	Shubenacadie boreholes		48.18	1.77	34.67	0.00	0.00	2.65	0.00	0.76	0.00	0.34	8.38	94.75
245	95-1-10	9	Ms	Shubenacadie boreholes		47.91	1.18	34.15	0.00	0.00	2.50	0.00	1.15	0.00	0.36	9.00	96.25
246	95-1-9	2	Ms	Shubenacadie boreholes		48.11	0.33	35.06	0.00	0.00	2.65	0.00	0.82	0.00	0.54	7.33	92.84
247	95-1-9	2	Ms	Shubenacadie boreholes		48.16	0.37	35.03	0.00	0.00	3.85	0.00	0.88	0.00	0.56	7.24	93.89
248	94-1-14	22	Ms	Shubenacadie boreholes		48.45	0.58	33.73	0.00	0.00	1.81	0.00	0.84	0.00	0.75	8.37	92.53
249	94-1-14	23	Ms	Shubenacadie boreholes		47.88	0.49	33.74	0.00	0.00	1.89	0.00	1.74	0.00	0.59	8.57	94.90
250	94-1-14	24	Ms	Shubenacadie boreholes		48.27	0.53	33.27	0.00	0.00	1.91	0.00	1.85	0.00	0.52	10.28	96.83
251	94-1-14	25	Ms	Shubenacadie boreholes		48.89	0.43	32.59	0.00	0.00	3.07	0.00	1.25	0.48	0.54	8.25	93.50
252	95-1-15	26	Ms	Shubenacadie boreholes		45.89	0.00	36.00	0.00	0.00	3.93	0.00	0.34	0.00	1.13	7.15	94.44
253	95-1-8	1	St	Shubenacadie boreholes		27.10	0.41	52.15	0.00	0.00	15.18	0.85	2.09	0.00	0.34	0.00	97.92
254	95-1-8	2	St	Shubenacadie boreholes		28.74	0.83	53.28	0.00	0.00	14.37	0.00	1.49	0.00	0.00	0.00	98.49
255	95-1-8	3	St	Shubenacadie boreholes		28.13	0.36	51.28	0.00	0.00	12.88	0.00	1.83	0.00	0.80	0.00	93.18
256	95-1-8	4	St	Shubenacadie boreholes		27.11	0.48	54.88	0.00	0.00	14.35	0.33	1.57	0.00	0.42	0.00	99.14
257	95-1-8	5	St	Shubenacadie boreholes		27.45	0.48	54.30	0.00	0.00	13.83	0.00	1.47	0.00	0.38	0.00	97.91

Table 3. Electron microprobe chemical analyses of silicate minerals (cont'd).

258	95-1-8	6	St	Shubenacadie boreholes		26.58	0.37	55.71	0.00	0.00	14.38	0.29	1.41	0.00	0.00	0.00	98.74
259	95-1-8	7	St	Shubenacadie boreholes		27.27	0.57	55.11	0.00	0.00	14.77	0.00	1.80	0.00	0.31	0.00	99.63
260	95-1-14	8	St	Shubenacadie boreholes		28.55	0.00	56.17	0.00	0.00	13.91	0.34	1.51	0.00	0.23	0.00	97.71
261	95-1-14	9	St	Shubenacadie boreholes		25.01	0.49	53.85	0.00	0.00	13.08	0.27	1.48	0.00	0.00	0.00	93.96
262	95-1-14	10	St	Shubenacadie boreholes		27.03	0.32	54.86	0.00	0.00	14.68	0.00	1.56	0.00	0.00	0.00	98.47
263	95-1-3	1	St	Shubenacadie boreholes		27.29	0.66	55.63	0.00	0.00	15.11	0.00	1.23	0.00	0.00	0.00	99.92
264	95-1-3	1	St	Shubenacadie boreholes		26.61	0.00	57.17	0.00	0.00	13.84	0.35	1.57	0.00	0.55	0.00	100.09
265	95-1-3	1	St	Shubenacadie boreholes		26.59	0.32	56.22	0.00	0.00	14.59	0.00	1.41	0.00	0.00	0.00	99.13
266	95-1-3	1	St	Shubenacadie boreholes		27.69	0.35	56.20	0.00	0.00	14.03	0.31	1.86	0.00	0.00	0.00	99.23
267	95-1-3	1	St	Shubenacadie boreholes		27.29	0.42	54.78	0.00	0.00	14.02	0.39	1.50	0.00	0.00	0.00	98.39
268	95-1-3	1	St	Shubenacadie boreholes		27.27	0.41	54.95	0.00	0.00	14.47	0.00	1.55	0.00	0.00	0.00	98.65
269	95-1-3	1	St	Shubenacadie boreholes		27.14	0.38	55.29	0.00	0.00	14.74	0.00	1.52	0.00	0.00	0.00	99.07
270	95-1-15	18	St	Shubenacadie boreholes		27.24	0.39	55.43	0.00	0.00	14.82	0.34	1.64	0.00	0.00	0.00	99.86
271	95-1-15	19	St	Shubenacadie boreholes		27.50	0.44	54.93	0.00	0.00	14.53	0.00	1.78	0.00	0.00	0.00	99.18
272	95-1-15	20	St	Shubenacadie boreholes		27.52	0.38	54.34	0.00	0.00	14.04	0.38	1.46	0.00	0.28	0.00	98.38
273	95-1-7	2	St	Shubenacadie boreholes		27.97	0.45	55.42	0.00	0.00	13.11	0.00	1.53	0.00	0.00	0.00	98.48
274	95-1-7	2	St	Shubenacadie boreholes		27.44	0.44	54.44	0.00	0.00	13.32	0.32	2.04	0.00	0.00	0.00	98.00
275	95-1-7	2	St	Shubenacadie boreholes		27.27	0.52	54.52	0.00	0.00	13.55	0.28	1.51	0.00	0.58	0.00	98.23
276	95-1-4	34	St	Shubenacadie boreholes		26.24	0.35	55.29	0.00	0.00	13.78	0.32	1.87	0.00	0.00	0.00	97.82
277	95-1-15	1	Pl	Shubenacadie boreholes		59.84	0.00	25.89	0.00	0.00	0.48	0.00	0.00	7.67	7.99	0.00	101.84
278	95-1-15	2	Pl	Shubenacadie boreholes		60.90	0.00	20.00	0.00	0.00	0.38	0.00	0.00	0.43	11.23	0.00	101.92
279	95-1-11	3	Pl	Shubenacadie boreholes		52.71	0.00	28.15	0.00	0.00	0.82	0.00	0.00	12.35	4.75	0.00	99.78
280	95-1-11	4	Pl	Shubenacadie boreholes		54.59	0.00	27.07	0.00	0.00	1.08	0.00	0.00	10.95	4.88	0.15	98.72
281	95-1-15	5	Pl	Shubenacadie boreholes		61.74	0.00	25.18	0.00	0.00	0.00	0.00	0.00	8.40	6.23	0.15	101.70
282	95-1-15	6	Pl	Shubenacadie boreholes		68.25	0.00	20.41	0.00	0.00	0.33	0.00	0.00	0.91	10.46	0.00	100.36
283	95-1-7	7	Pl	Shubenacadie boreholes		59.24	0.00	27.48	0.00	0.00	0.93	0.00	0.00	7.11	7.32	0.00	102.08
285	95-1-2	9	Pl	Shubenacadie boreholes		67.19	0.00	20.68	0.00	0.00	1.04	0.00	0.00	1.06	7.85	0.00	97.81
288	95-1-15	1	Bt	Shubenacadie boreholes		36.04	2.34	18.69	0.00	0.00	22.58	0.00	9.83	0.00	0.00	8.12	95.68
289	95-1-2	2	Bt	Shubenacadie boreholes		35.67	2.58	13.32	0.00	0.00	22.82	0.00	9.30	0.44	0.37	8.89	91.37
290	95-1-2	3	Bt	Shubenacadie boreholes		35.82	5.01	14.83	0.00	0.00	24.03	0.31	8.77	2.64	0.00	8.25	97.46
291	95-1-2	4	Bt	Shubenacadie boreholes		34.58	1.80	15.99	0.00	0.00	23.27	0.00	9.34	0.68	0.33	8.01	92.08
292	94-1-13	1	Kfs	Shubenacadie boreholes		65.48	0.00	18.68	0.00	0.00	0.00	0.00	0.00	0.00	1.48	15.02	100.62
293	94-1-13	2	Kfs	Shubenacadie boreholes		66.00	0.00	18.63	0.00	0.00	0.00	0.00	0.00	0.00	1.66	14.23	100.52
296	95-1-2	4	Kfs	Shubenacadie boreholes		64.50	0.00	18.48	0.00	0.00	0.76	0.00	0.00	0.00	0.27	14.07	98.06
297	95-1-2	6	Kfs	Shubenacadie boreholes		64.22	0.00	19.04	0.00	0.00	0.75	0.00	0.00	0.00	0.89	12.99	97.88
298	95-1-2	7	Kfs	Shubenacadie boreholes		60.77	0.00	21.46	0.00	0.00	1.91	0.00	0.59	0.00	0.35	13.21	98.29
299	95-1-2	8	Kfs	Shubenacadie boreholes		63.19	0.00	18.51	0.00	0.00	0.43	0.00	0.00	0.00	0.48	15.33	97.94
300	95-1-14	1	Tsz	Shubenacadie boreholes		32.32	0.00	54.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	86.73
301	95-1-5	2	Tsz	Shubenacadie boreholes		32.95	0.00	55.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.07
307	95-1-2	1	Tln	Shubenacadie boreholes		30.76	36.73	1.83	0.00	0.00	1.24	0.00	0.00	29.22	0.30	0.00	99.08
308	95-1-2	2	Tln	Shubenacadie boreholes		29.72	36.55	2.08	0.00	0.00	2.31	0.00	0.41	27.22	0.00	0.00	98.29
309	95-1-2	3	Tln	Shubenacadie boreholes		29.94	38.52	0.75	0.00	0.00	1.72	0.00	0.00	28.25	0.00	0.00	99.18
310	95-1-2	4	Tln	Shubenacadie boreholes		30.89	34.66	1.58	0.00	0.00	2.66	0.00	0.00	27.38	0.00	0.00	97.17
311	95-1-2	5	Tln	Shubenacadie boreholes		31.13	38.48	1.25	0.00	0.00	1.40	0.00	0.00	27.85	0.00	0.24	100.43
312	95-1-2	6	Tln	Shubenacadie boreholes		30.11	32.03	3.08	0.00	0.00	3.39	0.00	0.48	26.97	0.00	0.00	96.06
313	95-1-2	1	Chl	Shubenacadie boreholes		28.77	1.40	17.80	0.00	0.00	27.85	0.54	9.75	0.15	0.00	2.84	88.90
314	95-1-2	2	Chl	Shubenacadie boreholes		25.21	0.00	19.37	0.00	0.00	29.78	0.61	11.10	0.00	0.00	0.00	86.07
315	95-1-2	3	Chl	Shubenacadie boreholes		24.85	0.00	21.37	0.00	0.00	27.88	0.32	12.85	0.00	0.00	0.00	87.07
316	95-1-2	4	Chl	Shubenacadie boreholes		26.42	0.00	19.82	0.00	0.00	20.20	0.61	19.36	0.00	0.00	0.00	86.51
317	95-1-2	5	Chl	Shubenacadie boreholes		24.89	0.00	20.84	0.00	0.00	26.13	0.00	13.86	0.00	0.00	0.00	85.32
318	95-1-2	6	Chl	Shubenacadie boreholes		28.02	0.00	17.66	0.00	0.00	18.31	0.61	20.95	0.00	0.00	0.00	85.55
319	95-1-14	7	Chl	Shubenacadie boreholes		29.86	0.86	12.63	0.00	0.00	26.03	0.56	7.75	1.23	0.00	2.88	83.90
321	95-1-11	2	Ep	Shubenacadie boreholes		38.15	0.00	25.98	0.00	0.00	8.45	0.00	0.00	24.19	0.00	0.00	96.74
322	95-1-3	3	Ep	Shubenacadie boreholes		38.48	0.00	24.93	0.00	0.00	10.51	0.00	0.00	24.25	0.00	0.00	98.15
323	95-1-15	4	Ep	Shubenacadie boreholes		38.79	0.00	26.79	0.00	0.00	9.20	0.65	0.00	24.47	0.00	0.00	99.90
324	95-1-15	5	Ep	Shubenacadie boreholes		38.51	0.00	26.00	0.00	0.00	9.70	0.00	0.00	24.72	0.00	0.00	98.93
325	95-1-5	6	Ep	Shubenacadie boreholes		38.26	0.00	24.00	0.00	0.00	11.58	0.00	0.00	24.42	0.00	0.00	98.26
328	95-1-2	9	Ep	Shubenacadie boreholes		37.46	0.00	22.61	0.00	0.00	12.89	0.30	0.00	22.83	0.00	0.00	95.89
330	95-1-2	1	Ep	Shubenacadie boreholes		38.94	0.00	22.19	0.00	0.33	13.47	0.00	0.00	23.40	0.00	0.00	98.32
331	95-1-2	2	Ep	Shubenacadie boreholes		38.96	0.00	22.43	0.00	0.00	12.78	0.00	0.00	23.47	0.00	0.00	95.62
332	95-1-10	1	Tur	Shubenacadie boreholes		38.44	1.55	31.72	0.00	0.00	9.13	0.00	5.80	0.78	1.76	0.00	87.18
333	95-1-14	2	Tur	Shubenacadie boreholes		34.37	0.00	32.79	0.00	0.00	13.78	0.00	0.44	0.00	1.85	0.00	83.03
334	95-1-8	3	Tur	Shubenacadie boreholes		35.24	0.48	34.68	0.00	0.00	14.70	0.00	0.54	0.00	1.79	0.00	87.43
335	95-1-8	4	Tur	Shubenacadie boreholes		35.88	0.49	32.11	0.00	0.00	7.30	0.00	7.10	0.65	2.08	0.00	85.61
336	95-1-8	5	Tur	Shubenacadie boreholes		34.89	0.55	33.82	0.00	0.00	14.10	0.32	0.92	0.00	1.88	0.00	86.26
337	95-1-8	6	Tur	Shubenacadie boreholes		36.74	0.77	34.40	0.00	0.00	7.40	0.00	5.47	0.30	2.02	0.00	87.10
338	95-1-14	7	Tur	Shubenacadie boreholes		35.68	0.81	33.93	0.00	0.00	9.88	0.00	3.75	0.20	1.91	0.00	85.96
339	94-1-13	8	Tur	Shubenacadie boreholes	CORE	38.03	0.00	32.46	0.00	0.00	3.39	0.00	9.84	0.74	2.89	0.00	87.25
340	94-1-13	9	Tur	Shubenacadie boreholes	RIM	36.94	0.36	28.78	0.00	0.00	10.78	0.00	7.37	1.08	2.22	0.00	87.51
341	95-1-11	10	Tur	Shubenacadie boreholes		36.79	0.82	30.88	0.00	0.00	8.20	0.00	7.25	1.08	2.00	0.00	87.12

Table 3. Electron microprobe chemical analyses of silicate minerals (cont'd).

342	95-1-3	1	Tur	Shubenacadie boreholes	35.85	0.44	32.19	0.00	0.00	8.63	0.00	8.14	0.87	2.03	0.00	88.15
343	95-1-7	2	Tur	Shubenacadie boreholes	38.69	0.00	31.10	0.00	0.00	10.93	0.00	5.79	0.26	2.17	0.00	88.94
344	95-1-7	3	Tur	Shubenacadie boreholes	38.04	0.70	33.67	0.00	0.00	12.47	0.00	2.54	0.71	1.38	0.00	87.51
345	95-1-7	4	Tur	Shubenacadie boreholes	35.75	0.00	32.45	0.00	0.00	13.66	0.00	2.01	0.00	2.05	0.00	85.92
346	95-1-7	5	Tur	Shubenacadie boreholes	34.93	0.29	34.48	0.00	0.00	14.28	0.00	0.84	0.00	1.71	0.00	86.33
347	95-1-7	6	Tur	Shubenacadie boreholes	38.42	0.00	35.17	0.00	0.00	12.18	0.00	1.35	0.00	1.37	0.00	88.47
348	95-1-7	7	Tur	Shubenacadie boreholes	38.31	1.20	31.85	0.00	0.00	10.07	0.00	5.06	0.52	2.12	0.00	87.15
349	95-1-6	8	Tur	Shubenacadie boreholes	37.09	0.00	34.62	0.00	0.00	7.56	0.00	5.23	0.40	1.82	0.00	86.52
350	95-1-11	1	Cpx	Shubenacadie boreholes	50.51	1.60	3.09	0.00	0.00	12.36	0.30	13.25	20.19	0.47	0.00	101.77
351	95-1-11	2	Cpx	Shubenacadie boreholes	51.09	1.27	3.73	0.00	0.00	9.87	0.00	14.89	20.63	0.50	0.00	101.98
353	95-1-11	1	Opx	Shubenacadie boreholes	51.29	0.00	2.95	0.00	0.25	25.30	0.64	19.62	0.48	0.00	0.00	100.53
354	95-1-8	1	Amp	Shubenacadie boreholes	48.73	0.50	8.41	0.00	0.00	17.40	0.00	11.11	12.20	1.18	0.18	97.89
355	95-1-11	2	Amp	Shubenacadie boreholes	48.30	0.42	8.48	0.00	0.00	18.07	0.30	11.30	12.44	0.77	0.42	98.51
356	95-1-8	3	Amp	Shubenacadie boreholes	48.71	0.52	7.84	0.00	0.00	15.98	0.38	11.81	12.51	0.59	0.38	98.70
357	95-1-11	4	Amp	Shubenacadie boreholes	50.19	0.80	6.59	0.00	0.00	13.74	0.40	14.25	12.73	0.70	0.38	99.78
358	95-1-15	5	Amp	Shubenacadie boreholes	47.48	1.08	7.82	0.00	0.00	19.18	0.34	10.87	11.10	0.97	0.34	98.96
359	95-1-15	6	Amp	Shubenacadie boreholes	48.66	0.48	9.79	0.00	0.00	18.57	0.00	9.30	12.27	0.94	0.22	99.23
360	95-1-11	7	Amp	Shubenacadie boreholes	52.30	0.00	3.34	0.00	0.00	14.64	0.48	15.01	11.73	0.75	0.21	98.44
361	95-1-11	8	Amp	Shubenacadie boreholes	54.51	0.00	0.95	0.00	0.00	12.03	0.42	16.82	12.34	0.32	0.00	97.39
362	95-1-11	9	Amp	Shubenacadie boreholes	49.12	1.41	5.18	0.00	0.00	14.20	0.00	14.63	11.54	0.85	0.39	97.32
363	95-1-11	10	Amp	Shubenacadie boreholes	51.67	0.00	3.30	0.00	0.00	15.88	0.40	13.08	12.13	0.45	0.00	96.91
364	95-1-15	11	Amp	Shubenacadie boreholes	51.27	0.51	4.71	0.00	0.00	13.84	0.32	15.04	11.98	0.93	0.00	98.58
365	95-1-15	12	Amp	Shubenacadie boreholes	51.11	0.51	5.28	0.00	0.00	15.55	0.00	13.04	12.76	0.88	0.28	99.21
366	95-1-15	13	Amp	Shubenacadie boreholes	51.67	0.34	4.85	0.00	0.00	17.20	0.00	12.34	12.59	0.72	0.00	99.71
367	95-1-5	4	Amp	Shubenacadie boreholes	45.37	0.32	11.82	0.00	0.00	17.10	0.00	9.86	12.25	0.93	0.35	98.00
368	95-1-2	5	Amp	Shubenacadie boreholes	39.16	0.00	14.83	0.00	0.00	20.87	0.00	6.30	11.29	1.89	0.65	94.99
369	95-1-2	16	Amp	Shubenacadie boreholes	48.77	1.40	4.16	0.00	0.00	26.22	0.64	6.77	9.74	0.78	0.45	98.93
370	95-1-2	17	Amp	Shubenacadie boreholes	51.96	0.80	3.03	0.00	0.00	13.18	0.00	14.85	12.17	0.50	0.00	96.47
397	95-1-12	B	Ttn	Shubenacadie boreholes	30.18	35.83	1.18	0.00	0.00	2.04	0.09	0.02	28.79	0.01	0.00	98.14
398	95-1-12	C1	Hbl	Shubenacadie boreholes	41.42	1.57	11.05	0.00	0.01	18.00	0.57	9.32	11.86	1.42	1.44	96.68
399	95-1-12	C2	Hbl	Shubenacadie boreholes	41.24	1.57	10.86	0.00	0.00	17.97	0.57	9.33	11.87	1.43	1.41	96.25
401	94-2-3	A2	Ma	Shubenacadie boreholes	48.17	0.39	35.39	0.00	0.01	1.56	0.00	0.88	0.00	0.36	7.09	91.65
402	95-1-11	A5	Cpx	Shubenacadie boreholes	50.08	1.00	2.53	0.00	0.00	10.30	0.12	14.36	19.81	0.41	0.00	98.59
403	95-1-11	A6	Cpx	Shubenacadie boreholes	49.44	1.12	3.07	0.00	0.00	9.50	0.04	14.19	20.21	0.43	0.00	98.00
404	95-1-14	1	And	Shubenacadie boreholes	38.08	0.06	61.70	0.00	0.00	0.29	0.01	0.03	0.01	0.00	0.00	98.17
405	95-1-14	2	And	Shubenacadie boreholes	38.13	0.03	61.82	0.00	0.01	0.19	0.03	0.02	0.01	0.01	0.00	98.25
408	94-1-2	D	Toz	Shubenacadie boreholes	32.51	0.03	51.58	0.00	0.00	0.10	0.00	0.01	0.00	0.02	0.01	84.26
410	95-1-4	B	Toz	Shubenacadie boreholes	32.72	0.00	52.47	0.00	0.00	0.07	0.00	0.00	0.01	0.01	0.00	85.28
411	95-1-4	A	Toz	Shubenacadie boreholes	32.54	0.00	52.85	0.00	0.00	0.07	0.02	0.00	0.02	0.01	0.01	85.52
412	95-1-2	1	And	Shubenacadie boreholes	37.00	0.00	63.81	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	101.44
413	95-1-7	2	And	Shubenacadie boreholes	36.33	0.00	63.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.01

Table 4. Electron microprobe chemical analyses of phosphate and carbonate minerals.

File	Analysis No.	Borehole	Depth (m)	Analysis	Min'l	Locality	Pos'n	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	Cr_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	BaO	SrO	Cl	Total
1		SHU95-1		95-1-2	apatite	Shubenacadie boreholes		0.35					0.55			54.70			41.09			0.34	97.03
2		SHU95-1		95-1-2	apatite	Shubenacadie boreholes							0.66			56.65			42.04				99.35
3		SHU95-1		95-1-2	uphosphate	Shubenacadie boreholes	8+	0.45	3.42	29.09			2.19			5.40			25.14	5.92	2.82		74.43
4		SHU95-1		95-1-2	uphosphate	Shubenacadie boreholes	12+	0.79	2.93	28.01			1.82			2.83			25.75	6.97	3.52		72.62
5		SHU95-1		95-1-2	uphosphate	Shubenacadie boreholes	8		2.17	29.58			1.96			5.38			25.52	6.63	2.61		73.85
3		SHU95-1		95-1-2	uphosphate	Shubenacadie boreholes	12	0.44	1.85	28.05			1.51			2.79			25.52	7.23	3.15		70.54
1		SHU95-1		95-1-10	calcite	Shubenacadie boreholes	co	0.23					1.01	0.46		57.76							59.46
2		SHU95-1		95-1-9	calcite	Shubenacadie boreholes	ind						0.98	0.61	0.31	58.72							60.62
3		SHU95-1		95-1-9	calcite	Shubenacadie boreholes	ic						0.80	0.58	0.25	54.84							56.45
4		SHU95-1		95-1-4	calcite	Shubenacadie boreholes	ol						0.82		0.32	57.96							59.10
5		SHU95-1		95-1-13A	dolomite	Shubenacadie boreholes							1.01		19.65	31.17							51.83
6		SHU95-1		95-1-13A	dolomite	Shubenacadie boreholes							1.41		15.45	27.90							44.76
1		SHU94-1		94-1-14	dolomite	Shubenacadie boreholes	ind	0.20					0.84		20.04	33.58							54.66
2		SHU94-1		94-1-14	dolomite	Shubenacadie boreholes	lithicf						0.62		21.46	32.51							54.59
3		SHU94-1		94-1-14	dolomite	Shubenacadie boreholes	ind	0.19					1.05		20.41	33.10							54.75
4		SHU94-1		94-1-14	dolomite	Shubenacadie boreholes	ind	0.20					1.06		21.64	34.00							56.90
5		SHU94-1		94-1-14	dolomite	Shubenacadie boreholes	ind			0.41			0.82		18.42	36.38							56.03
6		SHU94-1		94-1-14	dolomite	Shubenacadie boreholes	ind	0.18					0.87		20.39	31.97							53.41
7		SHU94-1		94-1-14	dolomite	Shubenacadie boreholes	ind	0.16					0.80		21.57	32.72							55.25
8		SHU94-1		94-1-14	dolomite	Shubenacadie boreholes	ind	0.22					0.78		20.86	31.77							53.63
9		SHU94-1		94-1-14	dolomite	Shubenacadie boreholes	ind						0.95		21.82	32.09							54.86
10		SHU94-1		94-1-14	dolomite	Shubenacadie boreholes	ind	0.26					0.84		17.62	37.90						0.09	56.71
11		SHU94-1		94-1-14	dolomite	Shubenacadie boreholes	ind	0.55		0.32			0.90		20.18	32.62			0.29			0.15	55.01
12		SHU94-1		94-1-14	dolomite	Shubenacadie boreholes	ind						0.74		21.36	33.76							55.86
13		SHU94-1		94-1-14	dolomite	Shubenacadie boreholes	ind	0.23					1.07		21.30	31.26							53.86
14		SHU94-1		94-1-14	dolomite	Shubenacadie boreholes	ind	0.22					0.94		20.89	33.11							55.16

uphosphate = unidentified phosphate mineral, co=concretion, ind=independent crystal, ic=in contact with igneous clast, ol=overgrowth on a limonite, lithicf=lithic fragment
+=Analysis done by spectrum

Table 5. Electron microprobe chemical analyses of Fe-Ti oxides and hydroxides.

Locality	File	Rock-type	Sample No.	Analysis No.	Mineral	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Cr_2O_3	V_2O_3	ZnO	BaO	Na_2O	K_2O	NiO	TOTAL
Shubenacadie	1	sand	94-1-11	1	Rutile	0.00	100.24	0.94	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	101.51
Shubenacadie	2	sand	94-1-11	2	Rutile	0.00	98.96	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.33
Shubenacadie	3	sand	94-2-3	1	Rutile	0.00	100.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.05
Shubenacadie	4	sand	94-2-3	2	Rutile	0.00	99.07	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.58
Shubenacadie	5	sand	95-1-12	1	Ilmenite	0.00	53.40	0.00	43.02	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98.90
Shubenacadie	6	sand	95-1-12	2	Ilmenite	0.00	49.91	0.00	47.43	3.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.66
Shubenacadie	7	sand	95-1-12	3	Limonite	0.00	0.00	0.00	73.21	0.77	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	74.37
Shubenacadie	8	sand	95-1-12	4	Limonite	3.49	0.36	1.93	78.83	0.00	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	84.88
Shubenacadie	9	sand	95-1-12	5	Ilmenite	0.00	52.18	0.00	41.83	3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	97.21
Shubenacadie	10	sand	95-1-13	1	Rutile	1.43	98.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.08
Shubenacadie	11	sand	95-1-13	2	Hematite	0.00	1.91	0.00	88.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.19
Shubenacadie	12	sand	95-1-13	3	Limonite	3.19	0.82	0.88	76.70	0.71	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	82.59
Shubenacadie	13	sand	95-1-13	4	Limonite	2.67	0.63	2.43	69.69	1.47	0.43	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	77.53
Shubenacadie	14	sand	95-1-13	5	Limonite	2.67	0.00	0.29	76.85	0.00	0.22	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.85
Shubenacadie	15	sand	95-1-13	6	Limonite	1.85	0.00	0.00	74.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.30
Shubenacadie	16	sand	95-1-13	7	Limonite	5.27	0.00	0.42	72.56	0.33	0.41	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79.88
Shubenacadie	17	sand	95-1-13	8	Ilmenite	0.00	50.34	0.00	47.81	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.96
Shubenacadie	18	sand	94-1-4	1	Ilmenite	0.00	51.22	0.00	48.79	3.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	101.32
Shubenacadie	19	sand	94-1-4	2	Limonite	0.00	0.41	0.00	76.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.46
Shubenacadie	20	sand	94-1-4	3	Ilmenite	0.00	50.97	0.00	45.05	3.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Shubenacadie	21	sand	95-1-10	1	Limonite	0.00	1.48	0.00	81.96	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	83.74
Shubenacadie	22	sand	95-1-10	2	Limonite	1.98	0.40	3.13	73.30	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79.24
Shubenacadie	23	sand	95-1-10	3	Limonite	0.00	0.00	5.10	69.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	74.93
Shubenacadie	24	sand	95-1-10	4	Limonite	2.83	0.00	6.34	67.58	0.30	0.31	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	77.77
Shubenacadie	25	sand	95-1-10	5	Limonite	1.61	0.61	3.96	73.31	0.00	0.24	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.17
Shubenacadie	26	sand	95-1-10	6	Limonite	1.70	0.00	5.03	73.65	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.79
Shubenacadie	27	sand	95-1-10	7	Limonite	1.89	0.00	4.86	73.13	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.12
Shubenacadie	28	sand	95-1-10	8	Limonite	0.00	1.80	4.82	66.97	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	73.88
Shubenacadie	29	sand	95-1-002	1	Ti-Mgt	0.00	25.08	3.32	63.11	1.18	0.00	0.00	0.00	0.77	0.00	0.00	0.00	0.00	0.00	93.44
Shubenacadie	30	sand	95-1-002	2	Hematite	0.00	2.40	1.06	83.78	0.00	0.91	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	88.85
Shubenacadie	31	sand	95-1-002	3	Ti-Mgt	0.00	27.99	2.29	58.89	1.18	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.00	0.00	90.84
Shubenacadie	32	sand	95-1-002	4	Limonite	3.84	0.41	1.03	72.12	0.50	0.64	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	78.55
Shubenacadie	33	sand	95-1-002	5	Limonite	2.83	0.35	0.74	81.25	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	85.49
Shubenacadie	34	sand	95-1-009	1	Limonite	2.07	0.00	4.23	70.89	0.00	0.27	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	77.74
Shubenacadie	35	sand	95-1-009	2	Limonite	1.83	0.00	2.14	74.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	78.34
Shubenacadie	36	sand	95-1-009	3	Limonite	0.08	0.00	1.63	74.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.39
Shubenacadie	37	sand	95-1-009	4	Limonite	0.00	0.00	1.74	71.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	73.00
Shubenacadie	38	sand	95-1-009	5	Limonite	2.43	0.43	4.70	71.98	0.00	0.36	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.23
Shubenacadie	39	sand	95-1-009	6	Limonite	2.45	0.43	4.72	68.83	0.00	0.33	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	77.03
Shubenacadie	40	sand	95-1-009	7	Limonite	2.99	0.00	5.03	68.98	0.00	0.27	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	77.72
Shubenacadie	41	sand	95-1-009	8	Limonite	0.00	0.00	1.86	73.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	74.70
Shubenacadie	42	sand	95-1-009	9	Limonite	0.00	0.00	2.65	71.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	74.33
Shubenacadie	43	sand	95-1-009	10	Limonite	1.82	0.00	1.12	78.85	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	82.10
Shubenacadie	44	sand	95-1-009	11	Limonite	2.50	0.30	3.38	75.60	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	82.02
Shubenacadie	45	sand	95-1-4	1	Limonite	3.02	0.00	0.70	68.92	0.00	0.00	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	73.34
Shubenacadie	46	sand	95-1-4	2	Limonite	2.88	0.00	0.54	71.00	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	75.13
Shubenacadie	47	sand	95-1-4	3	Ilmenite	0.00	49.85	0.00	43.83	4.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	97.69
Shubenacadie	48	sand	95-1-4	4	Hematite	0.00	3.77	0.00	84.16	0.00	0.00	0.00	0.00	1.77	0.00	0.00	0.00	0.00	0.00	89.70
Shubenacadie	49	sand	95-1-4	5	Limonite	0.00	0.00	0.00	73.61	0.00	0.00	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	74.45
Shubenacadie	50	sand	95-1-002	6	Ilmenite	0.00	50.19	0.00	37.04	8.70	0.00	0.30	0.00	0.00	0.00	1.71	0.00	0.00	0.00	97.94
Shubenacadie	51	sand	95-1-002	7	Ilmenite	0.54	51.11	0.00	37.81	9.04	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.17
Shubenacadie	52	sand	95-1-002	8	Ilmenite	0.00	50.79	0.00	38.02	8.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	97.68
Shubenacadie	53	sand	95-1-002	9	Limonite	3.01	0.00	0.00	69.51	0.00	0.36	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	73.09
Shubenacadie	54	sand	95-1-002	10	Hematite	1.09	2.75	0.25	83.62	0.00	0.38	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.53
Shubenacadie	55	sand	95-1-10	9	Limonite	4.70	0.00	1.99	72.26	0.00	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79.82
Shubenacadie	56	sand	95-1-10	10	Limonite	2.10	0.00	1.05	77.35	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.73
Shubenacadie	57	sand	95-1-009	12	Limonite	1.32	0.00	0.49	80.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	82.03
Shubenacadie	58	sand	95-1-009	13	Rutile	0.00	97.13	0.00	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98.94
Shubenacadie	59	sand	95-1-002	11	Magnetite	0.00	0.00	0.00	93.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.54
Shubenacadie	60	sand	95-1-002	12	Magnetite	0.00	0.00	0.00	93.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.66
Shubenacadie	61	sand	95-1-002	13	Magnetite	0.00	0.00	0.00	92.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	92.30
Shubenacadie	62	sand	95-1-10	11	Rutile	1.91	94.34	0.33	1.36	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98.21
Shubenacadie	67	sand	95-008	1	Ilmenite	0.61	50.38	1.03	47.00	0.49	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.79
Shubenacadie	68	sand	95-1-14	1	Limonite	2.15	0.00	1.37	78.85	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	82.35
Shubenacadie	69	sand	95-1-14	2	Limonite	2.08	0.00	1.30	78.95	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	82.58
Shubenacadie	70	sand	95-1-11	1	Ilmenite	0.20	49.41	0.00	45.18	1.28	0.47	0.00	0.00	0.00	0.00	1.57	0.00	0.00	0.00	98.09
Shubenacadie	71	sand	95-1-11	2	Ilmenite	0.00	49.01	0.00	44.09	1.56	0.48	0.00	0.00	0.00	0.00	2.60	0.00	0.00	0.00	97.74
Shubenacadie	72	sand	95-1-005	1	Rutile	0.00	98.80	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.38

Table 5. Electron microprobe chemical analyses of Fe-Ti oxides and hydroxides (cont'd).

Shubenacadie	73	sand	95-1-00S	2	Goethite	3.11	0.00	1.01	81.38	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	86.08
Shubenacadie	74	sand	95-1-15	1	Goethite	2.85	0.00	2.99	80.36	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	86.66
Shubenacadie	75	sand	95-1-15	2	Goe/Lim	0.00	0.00	0.39	80.13	0.77	0.31	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	82.31
Shubenacadie	76	sand	95-1-15	3	Ilmenite	0.00	52.09	0.00	40.21	6.09	0.00	0.00	0.00	0.00	2.45	0.00	0.00	0.00	0.00	100.84
Shubenacadie	77	sand	95-1-15	4	Ilmenite	0.00	51.34	0.00	39.21	6.61	0.00	0.00	0.00	0.00	2.97	0.00	0.00	0.00	0.00	100.13
Shubenacadie	78	sand	95-1-4	6	Limonite	0.00	0.00	0.00	74.06	1.84	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	75.95
Shubenacadie	79	sand	95-1-4	7	Hematite	0.00	0.00	0.00	88.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.32
Shubenacadie	80	sand	95-1-4	8	Ti-Mgt	0.00	18.21	0.00	74.57	1.13	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	94.39
Shubenacadie	81	sand	95-1-4	9	Ilmenite	0.00	48.92	0.00	47.25	2.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98.99
Shubenacadie	82	sand	95-1-4	10	Limonite	9.77	0.42	1.12	67.96	1.10	0.00	1.24	0.00	0.00	1.34	0.00	0.00	0.00	0.00	82.95
Shubenacadie	83	sand	95-1-4	11	Ilmenite	0.00	21.52	0.93	73.35	2.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	97.94
Shubenacadie	84	sand	95-1-4	12	Ilmenite	0.00	48.74	0.00	47.24	3.63	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.83
Shubenacadie	85	sand	95-1-4	13	Ilmenite	0.00	48.52	0.00	47.40	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.52
Shubenacadie	86	sand	95-1-4	14	Ti-Mgt	0.00	24.47	0.92	68.35	2.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	95.75
Shubenacadie	87	sands	95-1-13b	1	Magnetite	0.14	5.15	0.44	86.73	0.81	0.02	0.07	0.00	0.00	0.00	0.00	0.02	0.00	0.00	93.38
Shubenacadie	88	sands	95-1-13b	2	Magnetite	0.06	3.65	0.41	89.27	0.83	0.03	0.10	0.01	0.00	0.00	0.00	0.01	0.00	0.01	94.18
Shubenacadie	89	sands	95-1-13b	3	Ti-Mgt	0.14	26.99	0.35	61.77	3.04	0.03	0.23	0.01	0.00	0.00	0.00	0.03	0.00	0.00	92.59
Shubenacadie	90	sands	95-1-13b	4	Ilmenite	0.07	42.29	0.01	39.23	5.09	0.03	8.08	0.00	0.00	0.00	0.00	0.02	0.00	0.00	94.82
Shubenacadie	91	sands	95-1-12b	2	Magnetite	0.03	0.82	0.03	90.18	0.17	0.01	0.46	0.08	0.00	0.00	0.00	0.00	0.05	0.15	92.06
Shubenacadie	92	sands	95-1-12b	3	Magnetite	0.00	0.56	0.01	90.87	0.14	0.02	0.32	0.06	0.00	0.00	0.00	0.00	0.07	0.15	92.20
Shubenacadie	93	sands	95-1-12b	4	Ilmenite	0.00	44.23	0.01	47.08	4.27	0.06	0.19	0.03	0.00	0.00	0.00	0.00	0.01	0.09	95.98
Shubenacadie	94	sands	95-1-12b	5	Ti-Mgt	0.00	29.32	0.01	60.58	3.07	0.06	0.21	0.08	0.00	0.00	0.00	0.00	0.03	0.13	93.49
Shubenacadie	95	sands	95-1-003	1	Magnetite	0.03	0.90	0.27	91.86	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.17
Shubenacadie	96	sands	95-1-003	2	Magnetite	0.04	1.12	0.28	91.09	0.11	0.01	0.00	0.03	0.00	0.00	0.00	0.02	0.00	0.00	92.70
Shubenacadie	97	sands	95-1-003	3	Ilmenite	0.00	50.79	0.00	44.89	3.30	0.05	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	99.05
Shubenacadie	98	sands	95-1-003	4	Ilmenite	0.01	50.18	0.02	43.99	2.86	0.05	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	97.10
Shubenacadie	99	sands	95-1-003	6	Magnetite	1.10	0.75	0.24	90.86	0.04	0.02	0.02	0.03	0.00	0.00	0.00	0.01	0.00	0.01	93.08
Shubenacadie	100	sands	95-1-003	7	Magnetite	0.03	0.79	0.04	90.12	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	91.02
Shubenacadie	101	sands	95-1-003	10	Rutile	0.00	88.69	0.02	4.77	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	93.51
Shubenacadie	102	sands	95-1-003	11	Rutile	0.08	86.49	0.48	4.98	0.01	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.01	92.09
Shubenacadie	103	sands	95-1-003	12	Rutile	0.21	81.16	0.84	8.81	0.02	0.05	0.06	0.06	0.00	0.00	0.00	0.01	0.00	0.01	91.02
Shubenacadie	104	sands	95-1-11a	1	Magnetite	3.72	7.49	0.46	79.55	0.21	0.01	3.51	0.00	0.00	0.00	0.00	0.01	0.00	0.01	94.97
Shubenacadie	105	sands	95-1-11a	2	Magnetite	1.90	6.16	0.33	84.84	0.25	0.03	1.53	0.00	0.00	0.00	0.00	0.03	0.00	0.00	95.07
Shubenacadie	106	sands	95-1-11b	1	Ilmenite	0.03	41.46	0.02	54.82	0.78	0.30	0.01	0.08	0.00	0.00	0.00	0.01	0.00	0.00	97.31
Shubenacadie	107	sands	95-1-11b	2	Ilmenite	0.01	39.46	0.00	55.82	0.68	0.28	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	98.38
Shubenacadie	108	sands	95-1-11b	3	Ti-Mgt	0.02	12.22	0.03	79.20	0.10	0.03	0.03	0.39	0.00	0.00	0.00	0.00	0.00	0.02	92.04
Shubenacadie	109	sands	95-1-11b	4	Ti-Mgt	0.02	10.10	0.05	80.41	0.08	0.03	0.03	0.34	0.00	0.00	0.00	0.00	0.00	0.04	91.08
Shubenacadie	110	sands	95-1-13a	1	Limonite	7.56	0.04	2.83	58.10	0.23	0.70	2.28	0.01	0.00	0.00	0.00	0.25	0.18	0.40	73.53
Shubenacadie	111	sands	95-1-13a	2	Limonite	14.05	0.13	8.83	49.15	0.21	0.43	1.78	0.00	0.00	0.00	0.00	0.29	0.56	0.41	75.84
Shubenacadie	112	sands	94-1-2c	1	Ilmenite	0.27	54.66	0.60	25.96	0.33	0.05	0.18	0.08	0.00	0.00	0.00	0.04	0.04	0.13	82.32
Shubenacadie	113	sands	94-1-2c	2	Rutile	2.29	88.31	1.42	0.41	0.18	0.03	0.29	0.08	0.00	0.00	0.00	0.19	0.03	0.13	93.34
Shubenacadie	114	sands	94-1-2e		Rut & Ilm	0.29	71.57	1.54	12.00	0.11	0.05	0.20	0.09	0.00	0.00	0.00	0.06	0.04	0.14	86.09
Shubenacadie	115	sands	94-1-2f	1(a)	Rutile	0.06	97.22	0.00	0.31	0.09	0.02	0.05	0.11	0.00	0.00	0.00	0.06	0.07	0.15	98.13
Shubenacadie	116	sands	94-1-2f	1(b)	Rutile	0.08	97.11	0.00	0.31	0.15	0.02	0.05	0.11	0.00	0.00	0.00	0.06	0.07	0.15	98.10
Shubenacadie	117	sands	94-1-2d	1	Limonite	2.74	0.05	2.45	77.70	0.00	0.03	0.21	0.20	0.00	0.00	0.00	0.05	0.01	0.00	83.44
Shubenacadie	118	sands	94-1-2d	2	Limonite	2.42	0.09	2.08	76.68	0.00	0.01	0.19	0.21	0.00	0.00	0.00	0.02	0.00	0.00	81.68
Shubenacadie	119	sands	94-1-2d	4	Limonite	6.52	0.00	9.83	58.86	0.00	0.00	0.06	0.03	0.00	0.00	0.00	0.00	0.00	0.00	75.10
Shubenacadie	120	sands	94-1-2d	5	Limonite	8.80	0.00	8.85	57.48	0.00	0.00	0.10	0.03	0.00	0.00	0.00	0.04	0.00	0.00	73.30
Shubenacadie	121	sands	94-1-2d	8	Rut & Ilm	0.48	87.48	0.73	16.77	0.77	0.02	0.26	0.00	0.00	0.00	0.00	0.03	0.00	0.00	86.52
Shubenacadie	122	sands	94-1-2d	7	Limonite	3.08	0.00	5.57	63.00	0.00	0.00	0.12	0.01	0.00	0.00	0.00	0.02	0.00	0.00	71.80
Shubenacadie	123	sands	94-1-2d	8	Limonite	4.23	0.00	6.47	61.70	0.00	0.02	0.12	0.02	0.00	0.00	0.00	0.01	0.00	0.00	72.57
Shubenacadie	124	sands	94-1-2d	9	Limonite	2.42	0.00	5.00	64.34	0.00	0.02	0.13	0.03	0.00	0.00	0.00	0.03	0.00	0.00	71.97
Shubenacadie	125	sands	94-1-2d	10	Limonite	1.84	0.02	4.20	66.56	0.00	0.02	0.11	0.04	0.00	0.00	0.00	0.03	0.00	0.00	72.82
Shubenacadie	126	sands	94-1-2d	12	Limonite	2.86	0.62	5.77	61.11	0.00	0.05	0.10	0.02	0.00	0.00	0.00	0.02	0.00	0.00	70.55

Letters, e.g. 95-1-13b, indicate different groups of probe analyses from the same polished thin section

Table 6. Electron microprobe chemical analyses of sulphide minerals (atomic %).

File	Analysis No.	Borehole	Depth	Analysis	Min'l	Locality	Pos'n	Fe	As	Cu	Zn	Cd	Co	Cd	S	Si	Al	Total
1		SHU95-1		95-1-2	pyrite	Shubenacadie boreholes		32.76							67.24			100.00
2		SHU95-1		95-1-2	pyrite	Shubenacadie boreholes		32.65	0.15						67.21			100.00
3		SHU95-1		95-1-2	pyrite	Shubenacadie boreholes		32.74							67.26			100.00
4		SHU95-1		95-1-2	pyrite	Shubenacadie boreholes		33.07							66.93			100.00
5		SHU95-1		95-1-9	pyrite	Shubenacadie boreholes		32.68							67.14			99.82
6		SHU95-1		95-1-4	pyrite	Shubenacadie boreholes		32.83	0.17						67.00			100.00
7		SHU95-1		95-1-4	pyrite	Shubenacadie boreholes		32.36	0.24						67.20			99.80
8		SHU95-1		95-1-10	pyrite	Shubenacadie boreholes		32.47	0.17						67.36			100.00
9		SHU95-1		95-1-1	pyrite	Shubenacadie boreholes		32.77							67.23			100.00
10		SHU94-1		94-4-19	pyrite	Shubenacadie boreholes		32.74	0.43						66.84			100.00
11		SHU94-4		94-4-19	pyrite	Shubenacadie boreholes		32.59	0.13						66.91			99.64
12		SHU94-4		94-4-19	pyrite	Shubenacadie boreholes		33.13							66.88			100.00
13		SHU95-1		95-1-12	pyrite	Shubenacadie boreholes		33.07							66.93			100.00
14		SHU95-1		95-1-12	pyrite	Shubenacadie boreholes		32.34							67.66			100.00
15		SHU95-1		95-1-12	pyrite	Shubenacadie boreholes		31.93							68.07			100.00
16		SHU95-1		95-1-12	pyrite	Shubenacadie boreholes		32.46							67.54			100.00
17		SHU95-1		95-1-9	pyrite	Shubenacadie boreholes		33.12							66.88			100.00
18		SHU94-1		94-1-13	pyrite	Shubenacadie boreholes		32.92	0.14						66.94			100.00
19		SHU95-1		95-1-15	pyrite	Shubenacadie boreholes		32.84							66.24	0.50	0.42	100.00
20		SHU94-1		94-1-13	pyrite	Shubenacadie boreholes		32.70							67.10	0.19		100.00
21		SHU94-1		94-1-14	pyrite	Shubenacadie boreholes		33.85	0.30				0.47		65.38			100.00
22		SHU94-1		94-1-14	pyrite	Shubenacadie boreholes		33.25	0.15						66.60			100.00
23		SHU95-1		95-1-15	pyrite	Shubenacadie boreholes		34.17							65.26	0.33	0.24	100.00
1		SHU94-1		94-1-14	chalcopyrite	Shubenacadie boreholes	clast	23.76		23.63	2.61				50.01			100.00
1		SHU94-1		94-1-14	sphalerite	Shubenacadie boreholes	ind	1.95			47.79	0.25			49.52	0.49		100.00
2		SHU94-1		94-1-13	sphalerite	Shubenacadie boreholes	clast	0.31			51.52				48.17			100.00

Table 7. Electron microprobe chemical analyses of altered ilmenite.

Locality	File	Rocktype	Sample No.	Mineral	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	K_2O	Cr_2O_3	V_2O_5	ZnO	Nb_2O_5	TOTAL
Shubenacadie	1	sand	95-1-002	ilm & rut	1.81	63.94	1.55	18.29	3.04	0.27	0.00	0.00	0.00	0.00	0.00	0.00	88.90
Shubenacadie	2	sand	95-1-002	ilm & rut	0.00	65.75	0.67	18.77	2.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.16
Shubenacadie	3	sand	95-1-002	ilm & rut	0.00	66.12	0.73	22.88	1.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	91.51
Shubenacadie	4	sand	95-1-002	ilm & rut	0.00	65.28	0.00	19.93	3.18	0.34	0.00	0.00	0.00	0.00	0.00	0.00	88.72
Shubenacadie	5	sand	95-1-002	ilm & rut	0.00	66.57	0.00	20.81	2.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	89.53
Shubenacadie	6	sand	95-1-002	ilm & rut	2.07	64.58	1.72	19.61	1.74	0.31	0.00	0.30	0.00	0.00	0.00	0.00	90.32
Shubenacadie	7	sand	95-1-002	ilm & rut	0.00	62.12	0.66	20.95	2.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	86.34
Shubenacadie	8	sand	95-1-10	ilm & rut	0.00	74.25	0.00	11.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	85.31
Shubenacadie	9	sand	95-1-10	ilm & rut	0.00	65.55	0.68	17.33	4.91	0.37	0.00	0.00	0.00	0.00	0.00	0.00	88.83
Shubenacadie	10	sand	95-1-10	ilm & rut	0.00	66.13	1.04	19.12	1.54	0.00	0.28	0.00	0.00	0.00	0.00	0.00	88.11
Shubenacadie	11	sand	95-1-10	ilm & rut	0.00	65.69	0.39	23.87	2.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	92.15
Shubenacadie	12	sand	95-1-009	ilm & rut	0.00	61.99	0.88	19.12	3.03	0.00	0.22	0.00	0.00	0.00	0.00	0.00	85.25
Shubenacadie	13	sand	95-1-009	ilm & rut	0.00	67.78	0.97	17.04	1.90	0.00	0.34	0.00	0.00	0.00	0.00	0.00	88.03
Shubenacadie	14	sand	95-1-009	ilm & rut	0.00	61.05	0.54	22.18	3.29	0.00	0.23	0.00	0.00	0.00	0.00	0.00	87.29
Shubenacadie	15	sand	95-1-003	ilm & rut	0.63	58.64	1.09	22.86	2.67	0.00	0.21	0.00	0.00	0.00	0.00	0.00	86.09
Shubenacadie	16	sand	95-1-15	ilm & rut	0.70	63.32	1.22	19.97	2.61	0.00	0.20	0.00	0.00	0.00	0.00	0.00	88.02
Shubenacadie	17	sand	95-1-15	ilm & rut	11.61	45.18	5.70	24.62	0.84	0.29	0.21	1.47	0.00	0.00	0.00	0.00	89.92
Shubenacadie	18	sand	95-1-15	ilm & rut	2.13	55.63	2.07	26.37	1.39	0.00	0.00	0.33	0.00	0.00	0.00	0.00	87.92
Shubenacadie	19	sand	95-1-002	ilm & rut	0.60	66.96	0.85	19.74	2.37	0.00	0.21	0.00	0.00	0.00	0.00	0.00	90.74
Shubenacadie	20	sand	95-1-008	ilm & rut	0.00	61.13	1.13	22.10	2.19	0.00	0.20	0.00	0.00	0.00	0.00	0.00	86.76
Shubenacadie	21	sand	95-1-008	ilm & rut	0.00	61.69	0.89	23.48	2.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.30
Shubenacadie	22	sand	95-1-15	ilm & rut	0.00	63.09	1.54	23.36	2.10	0.00	0.17	0.00	0.00	0.00	0.00	0.00	90.25
Shubenacadie	23	sand	95-1-15	ilm & rut	0.00	66.54	1.02	21.73	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.51
Shubenacadie	24	sand	95-1-15	ilm & rut	1.46	62.73	0.90	21.80	2.30	0.00	0.23	0.00	0.00	0.00	0.00	0.00	89.42
Shubenacadie	25	sand	95-1-003	ilm & rut	0.00	62.00	1.23	22.36	2.75	0.00	0.27	0.00	0.00	0.00	0.00	0.00	88.60
Shubenacadie	26	sand	95-1-10	ilm & rut	0.91	67.40	1.04	18.97	1.39	0.00	0.32	0.00	0.00	0.00	0.00	0.00	90.02
Shubenacadie	27	sand	95-1-15	ilm & rut	0.00	65.26	0.29	28.69	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	94.64
Shubenacadie	28	sand	94-1-11	ilm & rut	0.00	77.26	1.69	8.15	0.00	0.00	0.00	0.00	3.10	0.00	0.00	0.00	90.20
Shubenacadie	29	sand	94-1-11	ilm & rut	0.00	61.66	0.36	29.68	1.44	0.00	0.00	0.00	0.68	0.00	0.00	0.00	93.82
Shubenacadie	30	sand	94-1-11	ilm & rut	1.39	89.35	1.13	1.93	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	93.96
Shubenacadie	31	sand	94-1-11	ilm & rut	0.00	87.39	0.64	3.27	0.00	0.00	0.00	0.00	0.39	0.00	0.00	0.00	91.69
Shubenacadie	32	sand	94-2-3	ilm & rut	0.00	62.91	0.00	26.33	4.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	94.20
Shubenacadie	33	sand	94-2-3	ilm & rut	0.00	69.49	1.23	22.70	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.90
Shubenacadie	34	sand	94-2-3	ilm & rut	0.00	65.82	0.49	25.78	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	92.59
Shubenacadie	35	sand	94-2-3	ilm & rut	0.00	60.32	0.00	29.55	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.63
Shubenacadie	36	sand	94-2-3	ilm & rut	0.00	74.19	0.67	16.77	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	92.47

Table 7. Electron microprobe chemical analyses of altered ilmenite (cont'd).

Shubenacadie	37	sand	94-2-3	ilm & rut	0.00	63.00	0.00	29.49	2.27	0.20	0.00	0.00	0.00	0.00	0.00	0.00	94.96
Shubenacadie	38	sand	95-1-12	ilm & rut	0.00	69.83	0.49	18.04	2.15	0.24	0.00	0.00	0.00	0.00	0.00	0.00	90.75
Shubenacadie	39	sand	95-1-12	ilm & rut	0.00	68.45	0.53	18.20	2.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.12
Shubenacadie	40	sand	95-1-12	ilm & rut	0.00	67.50	0.67	18.58	1.53	0.00	0.24	0.00	0.00	0.00	0.00	0.00	88.53
Shubenacadie	41	sand	95-1-12	ilm & rut	0.00	64.09	0.68	20.41	3.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.81
Shubenacadie	42	sand	95-1-12	ilm & rut	0.00	61.30	1.95	25.85	1.11	0.00	0.16	0.00	0.00	0.00	0.00	0.00	90.37
Shubenacadie	43	sand	95-1-12	ilm & rut	0.00	69.02	0.50	22.90	1.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.99
Shubenacadie	44	sand	95-1-13	ilm & rut	0.00	67.07	0.78	18.45	2.77	0.00	0.21	0.00	0.00	0.00	0.00	0.00	89.27
Shubenacadie	45	sand	95-1-13	ilm & rut	0.00	66.86	0.58	19.40	3.89	0.00	0.23	0.00	0.00	0.00	0.00	0.00	90.98
Shubenacadie	48	sand	94-1-4	ilm & rut	0.00	68.30	0.99	15.58	1.23	0.00	0.25	0.00	0.00	0.00	0.00	0.00	86.35
Shubenacadie	49	sand	94-1-4	ilm & rut	0.00	60.16	1.26	25.19	1.19	0.00	0.35	0.00	0.00	0.00	0.00	0.00	88.14
Shubenacadie	50	sand	94-1-4	ilm & rut	0.00	64.95	0.79	23.24	1.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.77
Shubenacadie	51	sand	94-1-4	ilm & rut	0.00	66.17	0.33	22.50	1.67	0.00	0.21	0.00	0.00	0.00	0.00	0.00	90.88
Shubenacadie	52	sand	94-1-4	ilm & rut	0.00	60.15	0.45	28.47	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	89.56
Shubenacadie	53	sand	94-1-4	ilm & rut	0.00	73.34	0.54	16.19	1.80	0.00	0.25	0.00	0.00	0.00	0.00	0.00	92.11
Shubenacadie	54	sand	95-1-10	ilm & rut	0.00	64.26	0.64	22.49	1.39	0.00	0.19	0.00	0.00	0.00	0.00	0.00	88.97
Shubenacadie	55	sand	95-1-10	ilm & rut	0.00	71.18	0.91	17.21	1.76	0.00	0.27	0.00	0.00	0.00	0.00	0.00	91.32
Shubenacadie	56	sand	95-1-10	ilm & rut	0.00	67.66	0.79	19.58	3.62	0.00	0.27	0.00	0.00	0.00	0.00	0.00	91.92
Shubenacadie	57	sand	95-1-10	ilm & rut	0.00	86.41	0.89	9.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	96.69
Shubenacadie	58	sand	95-1-10	ilm & rut	0.00	67.12	0.25	23.54	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	91.50
Shubenacadie	59	sand	95-1-10	ilm & rut	0.00	64.54	1.66	23.64	0.78	0.00	0.22	0.00	0.00	0.00	0.00	1.00	91.82
Shubenacadie	60	sand	95-1-10	ilm & rut	0.00	60.27	0.78	26.86	0.52	1.58	0.00	0.00	0.00	0.00	0.00	0.00	90.03
Shubenacadie	61	sand	95-1-002	ilm & rut	0.00	60.30	0.40	34.37	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00	95.96
Shubenacadie	62	sand	95-1-002	ilm & rut	0.00	69.04	0.86	18.64	2.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	91.19
Shubenacadie	63	sand	95-1-002	ilm & rut	0.00	61.40	0.43	26.15	4.50	0.00	0.17	0.00	0.00	0.00	0.00	0.00	92.65
Shubenacadie	64	sand	95-1-002	ilm & rut	0.00	64.39	1.04	23.59	1.61	0.00	0.20	0.00	0.00	0.00	0.00	0.00	90.84
Shubenacadie	65	sand	95-1-002	ilm & rut	0.00	69.67	1.34	17.59	1.39	0.00	0.22	0.00	0.00	0.00	0.00	0.00	90.22
Shubenacadie	66	sand	95-1-002	ilm & rut	0.00	69.14	0.92	17.96	1.79	0.00	0.17	0.00	0.00	0.00	0.00	0.00	89.99
Shubenacadie	67	sand	95-1-002	ilm & rut	0.00	69.53	0.62	15.40	2.35	0.00	0.37	0.00	0.00	0.00	0.00	0.00	88.26
Shubenacadie	68	sand	95-1-4	ilm & rut	0.00	56.46	0.92	25.37	2.89	0.00	0.24	0.00	0.00	0.00	0.00	0.00	85.88
Shubenacadie	69	sand	95-1-4	ilm & rut	0.00	68.32	0.64	15.67	1.59	0.00	0.20	0.00	0.00	0.00	0.00	0.00	86.42
Shubenacadie	70	sand	95-1-4	ilm & rut	0.00	61.84	1.00	19.76	1.75	0.00	0.22	0.00	0.00	0.00	0.00	0.00	84.57
Shubenacadie	72	sand	95-1-009	ilm & rut	0.86	67.48	0.79	17.66	1.31	0.00	0.27	0.00	0.00	0.00	0.00	0.00	88.37
Shubenacadie	73	sand	95-1-10	ilm & rut	0.00	65.84	0.93	19.72	3.48	0.00	0.22	0.00	0.00	0.00	0.00	0.00	90.19
Shubenacadie	74	sand	95-1-10	ilm & rut	0.00	64.58	0.78	20.01	4.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.29
Shubenacadie	75	sand	95-1-10	ilm & rut	0.00	65.44	0.46	26.67	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	92.90
Shubenacadie	76	sand	95-1-10	ilm & rut	0.00	71.44	1.33	18.87	0.38	0.00	0.33	0.00	0.00	0.00	0.00	0.00	92.35
Shubenacadie	77	sand	95-1-009	ilm & rut	0.00	87.03	0.40	6.72	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	94.33
Shubenacadie	78	sand	95-1-009	ilm & rut	0.00	63.53	0.90	17.98	0.68	0.00	0.28	0.00	0.00	0.00	0.00	0.00	83.36

Table 8. Electron microprobe chemical analyses of metalloids (atomic %).

File	Bore hole	Sample	Depth (m)	Analysis	Metalloid	Fe	As	Mn	Zn	Cu	Cd	Ag	Sn	W	Cr	Ni	Co	B	Si	Na	Al	Total
1	95-1	95-1-10	61.9	D	Iron	97.18		0.54							1.20					1.09		100.01
2	95-1	95-1-9	64.9	1	Copper	0.93				91.58		3.88	3.64									100.01
3	95-1	95-1-9	64.9	2	Tungsten									100.00								100.00
4	95-1	95-1-9	64.9	3	Copper	1.82				91.65		3.19	3.36									100.01
5	95-1	95-1-9	64.9	4	Silver					11.41		82.69	5.85	0.25								100.00
6	95-1	95-1-9	64.9	5	Cremium	4.58				8.99		0.93	0.64	0.48	82.85	3.76						100.01
7	95-1	95-1-9	64.9	6	Copper	0.84				87.27		4.09	6.11		1.80							100.01
8	95-1	95-1-9	64.9	7	Silver					9.19		81.03	5.00						4.79			100.01
9	95-1	95-1-9	64.9	8	Tungsten									100.00								100.00
10	95-1	95-1-9	64.9	7A'	Silver					11.49		82.45	5.86	0.20								100.00
11	95-1	95-1-9	64.9	4A'	Silver					10.87		80.45	6.16						2.53			100.01
12	95-1	95-1-9	64.9	10	Tungsten									100.00								100.00
13	95-1	95-1-9	64.9	1	Tungsten									96.69					3.31			100.00
14	95-1	95-1-9	64.9	2	Tungsten									100.00								100.00
15	95-1	95-1-9	64.9	1	Copper	1.88				86.74		3.21	8.54	0.63								100.00
16	95-1	95-1-9	64.9	2	Copper	2.33				87.80		3.76	5.96	0.18								100.00
17	95-1	95-1-9	64.9	3	Copper	1.09				87.46		3.66	7.79									100.00
18	95-1	95-1-9	64.9	4	Sulfide?	1.39				7.43		59.57		0.19				31.23	3.19			100.00
19	95-1	95-1-9	64.9	5	Silver?	6.30				20.04		40.70	3.84	7.22	3.09		0.68	18.42				100.00
20	95-1	95-1-9	64.9	6	Sulfide?	1.14				43.44		20.99	2.42	0.48				31.54				100.00
21	95-1	95-1-9	64.9	7	Tungsten	2.99				4.03				92.98								100.00
22	95-1	95-1-9	64.9	8	Tungsten?	7.97				8.17		1.97	1.47	79.81					2.82			100.01
23	95-1	95-1-9	64.9	1	Silver?				8.73	3.99	29.44	57.85										100.01
24	95-1	95-1-9	64.9	2	Silver?				9.97	3.70	27.90	58.83										100.00
25	95-1	95-1-9	64.9	3	Silver?				8.72	3.37	29.37	58.54										100.00
26	95-1	95-1-9	64.9	1	Cu-Zn				36.54	59.92	0.31	3.16				4.08						100.01
27	95-1	95-1-9	64.9	2	Cu-Zn	0.42			36.17	59.86		3.57				3.98						100.00
28	95-1	95-1-9	64.9	3	Cu-Zn	0.94			34.47	56.57	0.41	3.78				3.83						100.00
29	95-1	95-1-9	64.9	4	Cu-Zn	0.94			33.73	57.28	0.42	3.93				3.73						100.01
30	95-1	95-1-9	64.9	5	Cu-Zn	0.63			34.88	57.04		3.97				3.48						100.00
31	95-1	95-1-8	56.3	N1	Iron	97.99	0.39	0.80							0.21				0.81			100.00
32	95-1	95-1-8	56.3	N2	Iron	96.16	0.45	0.71							0.26				2.14		0.29	100.01
33	95-1	95-1-8	56.3	S15b	Silver					14.00		78.86	4.68	1.54			1.12					100.00
34	95-1	95-1-8	56.3	Mag3	Iron	98.46	0.30	0.78											0.50			100.01
35	95-1	95-1-8	56.3	Mag4Q	Cu-Zn	1.78			38.98	58.05			1.20									100.01
36	95-1	95-1-4	45.4	Mag4c	Iron	98.28	0.37	0.85						0.11				0.40				100.01
37	95-1	95-1-4	45.4	Mag4a	Cu-Zn	1.59		0.50	41.04	52.35			0.52			4.01						100.01
38	95-1	95-1-4	45.4	Mag6b	Tungsten	4.23		3.87						89.89					2.08			100.00
39	95-1	95-1-4	45.4	Mag7e	Iron	97.19	0.42	0.89							1.16				0.54			100.00
40	95-1	95-1-4	45.4	Mag7g	Tungsten	4.43			13.37	15.58				64.17		2.45						100.00
41	95-1	95-1-4	45.4	Mag7f	Tungsten	1.96			3.65	3.02				91.36								100.00
42	95-1	95-1-13	44	1	Tungsten	1.21		2.20	13.72					75.00		0.31		7.56				100.00
43	95-1	95-1-13	44	2	Tungsten	0.57			1.93	6.70			0.02	84.98		0.41		5.39				100.00
44	95-1	95-1-13	44	3	Tungsten	0.63			0.80	12.39				78.80		0.19		7.19				100.00
45	95-1	95-1-13	44	4	Tungsten	1.03				11.93			0.09	77.80		0.10		9.06				100.00
46	95-1	95-1-13	44	5	Cu-Zn	1.31			34.29	58.10			0.12			2.67		2.34	0.03		1.15	100.01
47	95-1	95-1-13	44	6	Cu-Zn	0.98			28.97	65.26			0.11			2.33		2.21	0.06		0.08	100.00
48	95-1	95-1-13	44	7	Cu-Zn	1.52			31.38	61.44			0.10			2.46		3.08			0.02	100.00
49	95-1	95-1-13	44	8	Cu-Fe	33.68			3.66	58.02						1.84		4.10	0.03		0.64	100.00
50	95-1	95-1-13	44	9	Fe-Cu	54.45			14.27	22.27			0.01			4.98		3.71	0.17		0.16	100.00
51	95-1	95-1-13	44	10	Fe-Cu	72.78			1.37	16.91						0.33		3.73	4.48		0.39	100.00
52	95-1	95-1-13	44	11	Iron	84.89			1.57	7.84						0.22		1.84	4.05		0.02	100.00

Table 9. Electron microprobe chemical analyses of garnet and muscovite from potential source areas.

File	Sample No.	Min'l	Locality	Reference	Pos'n	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	Cr_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	Total
1	MT10051	Grt	Mount Thom Neoproterozoic		INT	36.83	0	20.96	0	0	29.73	6.19	3.57	2.36	0	0	99.67
2	MT10052	Grt	Mount Thom Neoproterozoic		INT	37.11	0	21.13	0	0	31.65	4.31	4.32	1.37	0.24	0	100.13
3	MT10053	Grt	Mount Thom Neoproterozoic		RIM	36.98	0	20.84	0	0	30.59	5.78	3.34	1.95	0.17	0	99.62
4	MT10054	Grt	Mount Thom Neoproterozoic	Meager 1995	CORE	37.25	0	21.14	0	0	31.08	4.51	4.3	1.23	0	0	99.51
5	MT10055	Grt	Mount Thom Neoproterozoic		RIM	36.86	0	20.97	0	0	29.93	6.23	3.63	1.94	0	0	99.56
6	MT10056	Grt	Mount Thom Neoproterozoic		CORE	37.4	0	21.09	0	0	31	4.77	4.19	1.4	0.2	0	100.05
7	8127A	Grt	Newfoundland Anorthosite		CORE	36.73	0.02	20.24	0	0	34.06	1.4	0.2	8.26	0.07	0	101.01
8	8127B	Grt	Newfoundland Anorthosite		RIM	36.52	0.06	19.88	0	0	36.03	1.17	0.24	6.07	0.06	0	99.63
9	8127C	Grt	Newfoundland Anorthosite		CORE	36.47	0	19.88	0	0	36.89	0.9	0.18	6.08	0.02	0	100.32
10	8127D	Grt	Newfoundland Anorthosite		RIM	36.45	0.02	20.46	0	0	35.75	0.39	0.59	6.61	0.07	0	100.34
11	8127E	Grt	Newfoundland Anorthosite		CORE	36.6	0	19.84	0	0	36.04	0.19	0.18	7.5	0	0	100.33
12	8127F	Grt	Newfoundland Anorthosite		RIM	36.56	0.1	20.46	0	0	36.63	0.36	0.52	6.03	0.09	0	100.75
13	8127G	Grt	Newfoundland Anorthosite		CORE	37.39	0.1	21.19	0	0	30.98	0.54	2.37	8.62	0	0	100.94
14	8127H	Grt	Newfoundland Anorthosite		RIM	36.92	0.13	20.36	0	0	33.29	0.46	1.07	7.8	0	0	99.81
15	8127I	Grt	Newfoundland Anorthosite		CORE	37.19	0.03	20.46	0	0	32.76	0.57	1.47	7.87	0.06	0	100.43
16	8127J	Grt	Newfoundland Anorthosite	Pe-Piper and Dessureau, 2002	RIM	36.54	0	20.57	0	0	36.62	0	0.39	6.36	0.1	0	100.78
17	8131AA	Grt	Newfoundland Anorthosite			36.44	0.08	21.56	0	0	25.15	1.03	7.55	5.98	0	0	99.7
18	8131AB	Grt	Newfoundland Anorthosite			36.36	0.08	21.34	0	0	27.72	1.36	6.7	4.75	0	0	100.34
19	8131AC	Grt	Newfoundland Anorthosite			37.98	0	21.52	0	0	28.36	1.49	6.69	3.66	0.02	0	99.72
20	8131AD	Grt	Newfoundland Anorthosite			38.01	0.26	21.19	0	0	28.98	1.29	6.52	5.66	0	0	99.79
21	8131AE	Grt	Newfoundland Anorthosite			38.1	0.06	21.86	0	0	28.96	1.2	6.63	5.47	0.11	0	100.2
22	8131BF	Grt	Newfoundland Anorthosite			38.37	0	21.51	0	0	28.11	1.3	6.67	4.63	0	0	100.79
23	8131BG	Grt	Newfoundland Anorthosite			38.43	0.19	21.58	0	0	24.88	0.88	7.59	6.17	0	0	99.51
24	8131BH	Grt	Newfoundland Anorthosite			38.45	0.1	21.41	0	0	27.2	1.56	6.13	5.86	0.02	0	100.73
25	8188aA	Grt	Newfoundland Anorthosite			40.1	0	22.74	0	0	20.08	0.96	11.36	5.93	0	0	101.23
26	8188cB	Grt	Newfoundland Anorthosite			39.77	0	22.66	0	0	20.96	1.09	10.47	5.8	0	0	100.81
27	90WPY5A	Grt	Wedgeport pluton		CORE	37.29	0.3	20.92	0	0	15.09	10.96	0.11	15.18	0.09	0	99.94
28	90WPY5B	Grt	Wedgeport pluton		RIM	37.41	0.29	21.18	0	0	17.13	10.02	0.27	13.78	0.08	0	100.09
29	90WPY5C	Grt	Wedgeport pluton		CORE	37.08	0.25	20.88	0	0	17.77	9.86	0.19	13.37	0.3	0.06	99.86
30	90WPY5D	Grt	Wedgeport pluton		CORE	37.34	0.29	21.13	0	0	16.14	11.7	0.16	14.79	0.07	0	100.62
31	90WPY5E	Grt	Wedgeport pluton		RIM	37.19	0.36	20.98	0	0	15.44	10.66	0.11	15.3	0.09	0	100.09
32	90WPY5F	Grt	Wedgeport pluton			37.51	0.27	21.08	0	0	15.27	12.06	0.18	14.06	0.08	0	101.36
33	90WPY5G	Grt	Wedgeport pluton		RIM	36.98	0.29	20.86	0	0	16.91	10.88	0.23	13.37	0.07	0	99.56
34	90WPY5H	Grt	Wedgeport pluton		CORE	37.74	0.34	20.97	0	0	15.55	11.62	0.09	15.03	0.08	0.06	101.48
35	90WPY5I	Grt	Wedgeport pluton		RIM	37.32	0.28	21.14	0	0	17.09	10.61	0.11	13.1	0.07	0	100.48
36	90WPY5J	Grt	Wedgeport pluton		CORE	37.39	0.29	20.91	0	0	15.69	11.73	0	14.48	0.08	0	100.73
37	90WPY6A	Grt	Wedgeport pluton		CORE	38.91	0.27	20.91	0	0	17.72	10.7	0.22	13.05	0.08	0	99.78
38	90WPY6B	Grt	Wedgeport pluton		INT	37.02	0.28	20.91	0	0	16.03	10.68	0	12.77	0.07	0	98.74
39	90WPY6C	Grt	Wedgeport pluton		RIM	36.92	0.25	20.77	0	0	19.22	10.7	0.15	11.73	0.08	0.05	99.87
40	90WPY6D	Grt	Wedgeport pluton		CORE	37.44	0.25	20.88	0	0	16.83	12.37	0	11.71	0.07	0	101.55
41	90WPY6E	Grt	Wedgeport pluton		RIM	37.37	0.27	21.07	0	0	18.01	11.39	0	12.88	0.07	0	100.85
42	90WPY14	Grt	Wedgeport pluton	The Study	CORE	37.39	0.29	20.88	0	0	17.84	11.09	0	13.25	0.11	0	100.82
43	90WPY14	Grt	Wedgeport pluton		INT	37.84	0.28	21.02	0	0	17.95	10.85	0	13.75	0.09	0	101.87
44	90WPY14	Grt	Wedgeport pluton		RIM	37.31	0.27	21.05	0	0	20.35	10.88	0.15	10.85	0.08	0.04	101
45	90WPY14	Grt	Wedgeport pluton		90WP	38.21	0.3	22.63	0	0	18.9	11.42	0.29	10	0.11	0.1	101.96
46	90WPY14	Grt	Wedgeport pluton		CORE	37.46	0.4	20.89	0	0	15.49	13.4	0	13.47	0.08	0	101.18
47	90WPY14	Grt	Wedgeport pluton		RIM	37.03	0.29	20.79	0	0	19.69	10.48	0	12.22	0.08	0	100.5
48	90WPY14	Grt	Wedgeport pluton		CORE	37.22	0.25	20.93	0	0	18.8	11.4	0.07	12.45	0.07	0	100.99
49	90WPY14	Grt	Wedgeport pluton		INT	37.23	0.28	21.02	0	0	19.3	11.13	0.08	12.38	0.08	0	101.44
50	90WPY14	Grt	Wedgeport pluton		RIM	36.97	0.25	20.82	0	0	20.04	10.98	0.13	11.46	0.07	0	100.33
51	90WPY14	Grt	Wedgeport pluton		RIM	36.78	0.25	20.88	0	0	19.32	12.35	0	10.88	0.09	0.04	100.54
52	90WPY14	Grt	Wedgeport pluton		CORE	36.66	0.25	21.04	0	0	19.14	11.32	0	12.07	0.08	0	100.79
53	90WPY14	Grt	Wedgeport pluton		RIM	36.66	0.25	20.74	0	0	19.63	11.16	0.1	10.3	0.09	0	99.13
54	90WPY14	Grt	Wedgeport pluton		RIM	37.44	0.25	20.94	0	0	17.9	10.15	0.07	14.07	0.09	0	100.9
55	90WPY14	Grt	Wedgeport pluton		CORE	37.41	0.33	21.09	0	0	16.69	12.37	0.13	12.58	0.09	0	100.69
56	90WPY14	Grt	Wedgeport pluton		CORE	37.9	0.3	20.98	0	0	15.2	11.78	0	14.63	0.07	0	100.34
57	90WPY14	Grt	Wedgeport pluton		RIM	37.1	0.28	20.98	0	0	18.41	9.47	0.08	13.26	0.09	0.05	99.72
58	NAS7210	Grt	Naskapi N-30 well basement		CORE	36.07	0.2	21.06	0	0.02	25.4	10.33	1.37	5.14	0	0	99.61
59	NAS7210	Grt	Naskapi N-30 well basement		RIM	36.82	0.47	20.72	0	0.02	28.98	7.98	1.78	2.36	0	0	100.14
60	NAS7210	Grt	Naskapi N-30 well basement		CORE	37	0.23	20.26	0	0.01	20.28	14.31	0.79	6.57	0	0	99.45
61	NAS7210	Grt	Naskapi N-30 well basement		RIM	37.32	0.1	21.07	0	0	31.47	6.38	1.83	1.9	0	0	100.17
62	NAS7210	Grt	Naskapi N-30 well basement			37.51	0.13	21.3	0	0.06	31.39	7.14	1.8	1.78	0	0	101.07
63	NAS7210	Grt	Naskapi N-30 well basement	The Study	CORE	37.4	0.19	21.02	0	0.04	25.34	10.16	1.37	4.8	0	0	100.32
64	NAS7210	Grt	Naskapi N-30 well basement		CORE	37.03	0.21	20.71	0	0	20.67	14	0.8	6.37	0	0	99.89
65	NAS7210	Grt	Naskapi N-30 well basement		RIM	36.51	0.19	20.77	0	0	22.02	12.62	0.96	6.72	0	0	99.81
66	NAS7210	Grt	Naskapi N-30 well basement		CORE	36.7	0.23	20.94	0	0	20.23	14.59	0.86	6.46	0	0	99.7
67	NAS7210	Grt	Naskapi N-30 well basement		RIM	36.2	0.07	21.09	0	0	31.81	6.75	1.77	1.76	0	0	101.55
68	DL003	Grt	NewCornwall syenogranite	Pe-Piper and Ingram, 2002	CORE	36.85	0	21	0	0	32.13	5.48	3.31	1.23	0	0	100
69	HC83L03	Grt	Halfway Cove Queensport pluton		CORE	35.99	0	20.87	0	0	25.88	10.6	1.47	0.34	0	0	100.82
70	HC83L03	Grt	Halfway Cove Queensport pluton		RIM	36.4	0	20.84	0	0	23.88	17.14	1.28	0.51	0	0	100.13
71	HC83L03	Grt	Halfway Cove Queensport pluton		RIM	36.14	0	20.9	0	0	23.7	17.25	1.3	0.5	0	0	99.79
72	HC83L03	Grt	Halfway Cove Queensport pluton		CORE	36.21	0	20.81	0	0	25.25	15.83	1.6	0.42	0	0	99.92
73	HC83L03	Grt	Halfway Cove Queensport pluton		RIM	36.32	0	21.15	0	0	23.83	17.4	1.28	0.49	0	0	100.47
74	HC83L03	Grt	Halfway Cove Queensport pluton	Hsm, 1988	CORE	35.91	0	21.12	0	0	24.82	16.7	1.44	0.39	0	0	100.39
75	HC83L03	Grt	Halfway Cove Queensport pluton		CORE	36.13	0	20.94	0	0	24.03	17.48	1.28	0.36	0	0	100.18
76	HC83L03	Grt	Halfway Cove Queensport pluton		RIM	36.31	0	21.12	0	0	24.48	16.98	1.39	0.52	0	0	100.78
77	HC83L03	Grt	Halfway Cove Queensport pluton		CORE	36.33	0	21.24	0	0	25.61	15.1	1.79	0.48	0	0	100.75
78	HC83L03	Grt	Halfway Cove Queensport pluton		RIM	36.06	0	20.44	0	0	24.35	16.88	1.21	0.51	0	0	99.45
79	HC83L03	Grt	Halfway Cove Queensport pluton		CORE	36.8	0	20.77	0	0	23.09	18.84	1.18	0.41	0	0	99.89
80	11F883L	Grt	Halfway Cove Queensport sediment		RIM	36.16	0	21.14	0	0	32.92	7.19	1.45	0.81	0	0	99.67
81	11F883L	Grt	Halfway Cove Queensport sediment		CORE	36.22	0	20.96	0	0	31.41	8.81	1.33	0.98	0	0	99.71
82	11F883L	Grt	Halfway Cove Queensport sediment		RIM	36	0	21.12	0	0	31.98	8.16	1.4	0.93	0	0	99.57
83	11F883L	Grt	Halfway Cove Queensport sediment		CORE	36.09	0	20.73	0	0	29.45	10.66	1.52	0.81	0	0	99.26
84	11F883L	Grt	Halfway Cove Queensport sediment		RIM	36.07	0	20.85	0	0	32.63	7.69	1.4	0.84	0	0	99.48
85	11F883L	Grt	Halfway Cove Queensport sediment		CORE	36.01	0	20.95	0	0	29.13	11.32	1.52	0.83	0	0	99.76

Table 9. Electron microprobe chemical analyses of garnet and muscovite from potential source areas (cont'd).

File	Sample No.	Min'l	Locality	Reference	Pos'n	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	Cr_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	Total
86	11F983L	Grt	Halfway Cove Queensport sediment	Ham, 1988	CORE	38.19	0	20.81	0	0	31.14	8.29	1.54	1.02	0	0	99.98
87	11F983L	Grt	Halfway Cove Queensport sediment		Rim	38.19	0	20.08	0	0	32.75	7.44	1.52	0.89	0	0	99.84
88	11F983L	Grt	Halfway Cove Queensport sediment		CORE	38.05	0	20.89	0	0	32.12	8.29	1.42	0.92	0	0	99.89
89	11F983L	Grt	Halfway Cove Queensport sediment		Rim	38.08	0	20.92	0	0	31.35	9.28	1.52	0.87	0	0	100.
90	11F983L	Grt	Halfway Cove Queensport sediment		CORE	38.85	0	20.97	0	0	28.98	10.99	1.35	0.81	0	0	99.93
91	11F983L	Grt	Halfway Cove Queensport sediment		CORE	38.35	0	20.91	0	0	32.52	7.42	1.36	0.89	0	0	99.47
92	HC83L01	Grt	Halfway Cove Queensport pluton		Rim	38.57	0	20.88	0	0	26.5	18.91	0.36	0.14	0	0	99.37
93	HC83L01	Grt	Halfway Cove Queensport pluton		CORE	38.36	0	20.99	0	0	25.8	17.15	0.4	0.12	0	0	99.51
94	HC83L01	Grt	Halfway Cove Queensport pluton		CORE	38.36	0	20.88	0	0	24.13	18.97	0.34	0.13	0	0	99.56
96	HC83L01	Grt	Halfway Cove Queensport pluton		Rim	38.9	0	20.87	0	0	25.43	17.09	0.39	0.19	0	0	99.81
96	MS1003A	Grt	Rawdon Meguma Gp metasediment	Haysom, 1984		38.94	0.5	20.55	0	0	12.44	28.3	0.21	2.9	0	0	101.54
97	MS1003B	Grt	Rawdon Meguma Gp metasediment			33.19	3.88	18.68	0	0	19.22	23.5	0.29	2.42	0	0	100.18
98	MS1003C	Grt	Rawdon Meguma Gp metasediment			37.11	0	20.21	0	0	11.28	29.98	0.23	2.7	0	0	101.47
99	ASA	Grt	South Mountain batholith	Allen and Clarke, 1981		38.75	0	20.72	0	0	33.05	4.62	3.84	1.29	0	0	100.37
100	CHB	Grt	South Mountain batholith			38.29	0	21.21	0	0	33.71	2.74	3.52	1.22	0	0	99.69
101	ECC	Grt	South Mountain batholith			38.8	0	20.75	0	0	36.59	1.56	4.01	1.18	0	0	99.09
102	EDD	Grt	South Mountain batholith			35.63	0	20.28	0	0	32.65	6.91	2.6	0.93	0	0	99.18
103	EDE	Grt	South Mountain batholith			38.03	0	20.33	0	0	33.12	6.27	2.63	1.02	0	0	99.4
104	KLF	Grt	South Mountain batholith			38.34	0	20.87	0	0	33.5	4.59	3.64	1.12	0.04	0	100.09
105	MUG	Grt	South Mountain batholith			37.21	0	21.48	0	0	31.13	2.88	5.97	1.4	0	0	99.87
106	NGH	Grt	South Mountain batholith			38.15	0	20.85	0	0	33.97	2.24	4.43	1.05	0.06	0	98.57
107	SMBAV1	Ms	South Mountain batholith	Ham and Kontak, 1988		45.97	0.07	35.57	0	0	2.08	0.07	0.7	0.01	0.81	10.46	95.44
108	SMBAV2	Ms	South Mountain batholith			45.44	0.38	35.86	0	0	1.34	0.01	0.54	0.01	0.56	10.65	94.79
109	SMBAV3	Ms	South Mountain batholith			45.48	0.14	34.14	0	0	1.78	0.05	0.67	0.01	0.72	10.33	93.32
110	SMBAV4	Ms	South Mountain batholith			45.08	0.21	34.27	0	0	2.43	0.03	0.83	0	0.7	10.46	94.19
111	SMBAV5	Ms	South Mountain batholith			45.5	0.08	35.37	0	0	2.29	0.08	0.7	0.01	0.74	10.58	95.34
112	SMBAV6	Ms	South Mountain batholith			44.99	0.28	34.38	0	0	1.82	0.01	0.66	0.03	0.67	11.11	93.64
113	SMBAV7	Ms	South Mountain batholith			45.96	0.3	34.15	0	0	1.83	0.08	1.17	0.01	0.37	11.14	94.99
114	SMBAV8	Ms	South Mountain batholith			45.74	0.25	34.88	0	0	1.81	0.02	1.15	0.01	0.42	10.58	94.72
115	SMBAV9	Ms	South Mountain batholith			45.28	0.16	36.72	0	0	2.23	0.11	0.34	0	0.66	9.98	94.67
116	SMBAV10	Ms	South Mountain batholith			44.98	0.07	38.11	0	0	2.28	0.09	0.18	0.01	0.91	10.13	94.74
117	SMBAV11	Ms	South Mountain batholith			44.78	0.1	38.11	0	0	2.07	0.07	0.28	0	1.22	10.83	95.22
118	SMBAV12	Ms	South Mountain batholith			45.51	0.64	36.07	0	0	1	0.03	0.46	0	0.58	9.85	94.25
119	SMBAV13	Ms	South Mountain batholith			46.22	0.63	36.28	0	0	0.88	0.03	0.41	0.02	0.47	10.15	95.14
120	SMBAV14	Ms	South Mountain batholith			45.52	0.14	35.49	0	0	1.42	0.05	0.75	0.03	0.59	10.62	94.61
121	SMB1	Ms	South Mountain batholith			46.43	0.08	34.73	0.22	0	1.31	0	0.7	0.03	1.35	9.97	94.82
122	SMB2	Ms	South Mountain batholith			46.29	0.24	34.45	0.58	0	1.8	0	0.89	0.02	1.23	10.08	95.38
123	SMB3	Ms	South Mountain batholith			46.04	0.17	35.7	0.73	0	0.87	0	0.64	0.03	1.23	9.82	95.23
124	SMB4	Ms	South Mountain batholith			46.43	0.05	36.1	0.64	0	0.85	0	0.58	0.02	1.15	9.84	95.74
125	SMB5	Ms	South Mountain batholith			46.7	0.32	37.12	0.08	0	1	0	0.52	0.02	1.31	10.01	97.08
126	46 7	Ms	South Mountain batholith			46.4	0.23	35.58	0.83	0	1.43	0	0.77	0.02	1.47	10.19	97.02
127	SMB8	Ms	South Mountain batholith			46.14	0.5	36.84	0.35	0	2.26	0.08	0.46	0.02	0.81	9.9	96.96
128	SMB10	Ms	South Mountain batholith			45.66	0.49	34.94	0.81	0	2.66	0.09	0.57	0.04	0.69	9.79	95.83
129	SMB11	Ms	South Mountain batholith			45.23	0.34	30.41	0.77	0	9.18	0.11	0.44	0.04	0.89	10.37	94.26
130	SMB12	Ms	South Mountain batholith			45.73	0.25	32.51	2.34	0	3.13	0.08	0.46	0.03	0.88	10.05	95.44
131	SMB13	Ms	South Mountain batholith			45.56	0.46	30.78	6.49	0	0.9	0.12	0.56	0.03	0.75	10.13	95.79
132	SMB14	Ms	South Mountain batholith			45.73	0.23	34.87	1.08	0	2.07	0.05	0.49	0.01	0.59	10.17	95.29
133	SMB16	Ms	South Mountain batholith			45.81	0.35	35.22	0.9	0	1.37	0.05	0.84	0	0.71	10.12	95.37
134	SMB18	Ms	South Mountain batholith			45.8	0.17	31.59	1.48	0	2.4	0.04	0.51	0.02	0.85	9.9	92.64
135	SMB17	Ms	South Mountain batholith			45.94	0.3	30.86	0.48	0	2.8	0.09	1.45	0.02	0.7	10.19	92.72
136	SMB19	Ms	South Mountain batholith			45.35	0.49	34.64	0.63	0	0.47	0	0.7	0.03	1.37	9.85	93.33
137	SMB19	Ms	South Mountain batholith			45.42	0.27	32.27	0.94	0	1.7	0.04	0.74	0.03	1.25	10.05	92.71
138	EKB6105	Ms	East Kemptville leucogranite	Ham and Kontak, 1988		47.98	0	31.88	0	0	4	0.22	0.15	0.01	0.27	11.04	95.36
139	EKB6105	Ms	East Kemptville leucogranite			48.82	0.2	29.87	0	0	6.48	0.3	0.26	0.01	0.17	10.4	95.51
140	EKB623A	Ms	East Kemptville leucogranite			46.5	0.21	24.53	0	0	9.6	0.12	0.27	0.03	0.17	10.55	91.98
141	EKB623B	Ms	East Kemptville leucogranite			48.29	0.11	24.63	0	0	8.18	0	0.34	0.04	0.14	10.26	91.99
142	EKB699A	Ms	East Kemptville leucogranite			47.29	0.34	25	0	0	8.78	0.08	0.27	0.03	0.14	10.98	92.87
143	EKB699B	Ms	East Kemptville leucogranite			47.58	0.23	25.85	0	0	8.12	0.11	0.3	0.04	0.09	10.98	93.1
144	TM861A	Ms	East Kemptville leucogranite			48.1	0.38	29.21	0	0	9.32	0	0.33	0.01	0.15	10.93	95.11
145	TM861B	Ms	East Kemptville leucogranite			47.3	0.36	28.36	0	0	7.8	0	0.31	0.03	0.32	10.56	95.04
146	FG0181	Ms	Sangster Liv/Larrys River plutons	O'Reilly, 1988		46.3	0.83	38.29	0	0	1.31	0	0.42	0	0.29	10.89	98.32
147	FG0182	Ms	Sangster Liv/Larrys River plutons			46.41	0.51	35.7	0	0	1.49	0	0.59	0	0.19	10.8	95.68
148	FG0183	Ms	Sangster Liv/Larrys River plutons			45.73	1.02	35.78	0	0	1.25	0	0.48	0	0.28	10.57	95.09
149	FG0184	Ms	Sangster Liv/Larrys River plutons			46.16	0.7	36.06	0	0	1.4	0	0.48	0	0.38	10.67	95.87
150	FG0185	Ms	Sangster Liv/Larrys River plutons			46.7	0.72	35.12	0	0	1.62	0	0.64	0	0.17	10.85	95.82
151	FG0186	Ms	Sangster Liv/Larrys River plutons			46	2.16	34.52	0	0	1.52	0	0.58	0	0.15	10.7	95.61
152	FG0187	Ms	Sangster Liv/Larrys River plutons			45.57	1.04	35.58	0	0	1.17	0	0.38	0	0.3	10.43	94.45
153	FG0188	Ms	Sangster Liv/Larrys River plutons			46.04	0	35.83	0	0	1.12	0	0.43	0	0.09	10.8	94.4
154	FG0189	Ms	Sangster Liv/Larrys River plutons			46.25	0.3	36.16	0	0	1.27	0	0.22	0	0.21	10.82	95.23
155	SL151	Ms	Sangster Liv/Larrys River plutons			46.7	0.67	34.77	0	0	1.81	0	0.82	0	0	11.06	95.83
156	SL152	Ms	Sangster Liv/Larrys River plutons			46.01	0.28	35.48	0	0	1.72	0	0.83	0	0.09	10.86	95.04
157	SL153	Ms	Sangster Liv/Larrys River plutons			45.98	0.41	34.78	0	0	1.84	0	0.49	0	0.33	10.53	94.36
158	SL154	Ms	Sangster Liv/Larrys River plutons			46.1	0.07	35.59	0	0	1.65	0	0.46	0	0.18	10.78	94.83
159	SL155	Ms	Sangster Liv/Larrys River plutons			46.5	0	35.95	0	0	1.58	0	0.39	0	0.17	10.95	95.52
160	SL156	Ms	Sangster Liv/Larrys River plutons			45.79	0	36.39	0	0	1.38	0	0.3	0	0.27	10.94	95.08
161	SL157	Ms	Sangster Liv/Larrys River plutons			47.4	0.11	33.94	0	0	1.89	0	0.51	0	0.81	9.35	94.11
162	LR51	Ms	Sangster Liv/Larrys River plutons			45.75	0	35.55	0	0	1.43	0	0.7	0	0	11.04	94.47
163	LR52	Ms	Sangster Liv/Larrys River plutons			45.5	0.62	35.91	0	0	1.37	0	0.5	0	0	11.29	95.19
164	LR53	Ms	Sangster Liv/Larrys River plutons			45.52	0.71	35.19	0	0	1.59	0	0.65	0	0	10.91	94.57
165	LR54	Ms	Sangster Liv/Larrys River plutons			45.39	0.37	35.87	0	0	1.2	0	0.4	0	0.14	10.78	94.13
166	LR55	Ms	Sangster Liv/Larrys River plutons			45.35	0.87	35.45	0	0	1.12	0	0.52	0	0.52	10.3	94.13
167	LR56	Ms	Sangster Liv/Larrys River plutons			45.45	0.83	35.65	0	0	1.02	0	0.43	0	0.48	10.33	94.17
168	LR57	Ms	Sangster Liv/Larrys River plutons			45.47	0.88	35.57	0	0	1.24	0	0.52	0	0.22	10.44	94.32

Table 9. Electron microprobe chemical analyses of garnet and muscovite from potential source areas (cont'd).

Fig.	Sample No.	Min'l	Locality	Reference	Pos'n	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	Cr_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	Total
169	FG0031	Ms	Sangster LkiLarrys River plutons			45.17	0.5	35.04	0	0	1.94	0	0.53	0	0.12	10.67	93.97
170	FG0032	Ms	Sangster LkiLarrys River plutons			45.64	0.35	34.97	0	0	1.89	0	0.49	0	0.14	10.71	94.2
171	FG0033	Ms	Sangster LkiLarrys River plutons			45.78	0.29	35.36	0	0	1.98	0	0.53	0	0.17	10.71	94.48
172	FG0034	Ms	Sangster LkiLarrys River plutons			47.02	0.07	34.49	0	0	1.89	0	0.84	0	0	10.64	94.71
173	FG0035	Ms	Sangster LkiLarrys River plutons			46.75	0.02	34.51	0	0	1.95	0	0.7	0	0.49	10.6	95.02
174	FG0036	Ms	Sangster LkiLarrys River plutons			46.19	0	33.98	0	0	2.39	0	0.8	0	0	10.58	93.91
175	FG0037	Ms	Sangster LkiLarrys River plutons			46.28	0.08	34.77	0	0	1.88	0	0.51	0	0.2	10.79	94.47
176	FG0011	Ms	Sangster LkiLarrys River plutons			46.06	0.34	35.66	0	0	1.7	0	0.41	0	0.39	10.61	95.17
177	FG0012	Ms	Sangster LkiLarrys River plutons			45.9	0.58	35.37	0	0	1.5	0	0.3	0	0.33	10.51	94.49
178	FG0013	Ms	Sangster LkiLarrys River plutons		SEC	46.3	0.27	34.66	0	0	2.33	0	0.66	0	0	10.9	95.04
179	FG0014	Ms	Sangster LkiLarrys River plutons		SEC	46.17	0.4	35	0	0	2.61	0	0.56	0	0.21	10.83	95.58
180	FG0015	Ms	Sangster LkiLarrys River plutons		SEC	46.28	0.02	36.6	0	0	1.83	0	0.3	0	0.28	10.7	94.96
181	FG0016	Ms	Sangster LkiLarrys River plutons		SEC	46.06	0	36.12	0	0	1.58	0	0.12	0	0	10.8	94.67
182	FG0017	Ms	Sangster LkiLarrys River plutons		SEC	45.44	0	36.42	0	0	1.58	0	0	0	0.21	10.62	94.24
185	FG0018	Ms	Sangster LkiLarrys River plutons		SEC	46.24	0	37.52	0	0	1.24	0	0	0	0.11	10.82	95.93
184	FG0019	Ms	Sangster LkiLarrys River plutons		SEC	46.18	0.22	34.58	0	0	3.2	0	0.6	0	0.06	10.54	95.38
185	FG0051	Ms	Sangster LkiLarrys River plutons		SEC	46.44	0.29	34.46	0	0	1.98	0	0.63	0	0.24	10.62	94.67
186	FG0052	Ms	Sangster LkiLarrys River plutons		SEC	46.07	0.16	34.1	0	0	2.28	0	0.83	0	0	10.74	94.18
187	FG0053	Ms	Sangster LkiLarrys River plutons		SEC	46.03	0.08	36.24	0	0	1.19	0	0.16	0	0.44	10.67	94.79
188	FG0054	Ms	Sangster LkiLarrys River plutons		SEC	46.95	0.34	34.45	0	0	2.53	0	0.53	0	1.02	10.67	96.47
189	FG0055	Ms	Sangster LkiLarrys River plutons		SEC	46.99	0	36.06	0	0	1.7	0	0.27	0	0.32	10.15	94.19
371	8141A1	Grt	Clarke Head granulite		T1*	39.08	0.12	20.86	0	0	26.49	1.44	6.31	0.42	0.12	0	100.93
372	8141A2	Grt	Clarke Head granulite		T1	38.87	0.15	20.58	0	0	26.42	1.43	6.42	0.41	0.11	0	100.39
373	8141A3	Grt	Clarke Head granulite		T1	38.13	0.14	20.61	0	0	26.6	1.39	6.2	0.55	0.11	0	100.93
374	8141A4	Grt	Clarke Head granulite		T1	38.66	0.21	20.59	0	0.12	26.28	1.31	6.3	0.41	0.14	0	100.3
375	8141A5	Grt	Clarke Head granulite		T1	38.72	0.09	20.78	0	0	26.61	1.38	6.17	0.4	0.17	0	100.28
376	8141A6	Grt	Clarke Head granulite		T1	38.66	0.14	20.73	0	0	26.9	1.84	5.61	0.35	0.2	0	100.63
377	8141A7	Grt	Clarke Head granulite		T2	39.34	0.1	21.36	0	0.08	24.95	1.3	6.88	0.33	0.12	0	100.49
378	8141A8	Grt	Clarke Head granulite		T2	38.98	0.16	21.53	0	0	25.19	1.28	7.01	0.22	0.23	0	100.6
379	8141A9	Grt	Clarke Head granulite		T2	39.25	0	21.23	0	0.09	24.98	1.29	6.79	0.3	0.18	0	100.07
380	8141A10	Grt	Clarke Head granulite		T2	39.34	0	20.9	0	0	25.1	1.27	7.01	0.2	0.18	0	99.99
381	8141A11	Grt	Clarke Head granulite		T2	39.33	0.14	21.43	0	0	25.37	1.56	6.53	0.41	0.18	0	100.92
382	8141As	Grt	Clarke Head granulite		T1	38.75	0.18	20.88	0	0	26.93	1.15	6.04	0.33	0.21	0	100.45
383	8141As	Grt	Clarke Head granulite	This Study	T1	38.84	0.13	20.57	0	0.1	26.75	1.26	6.02	0.29	0.08	0	99.86
384	8141As	Grt	Clarke Head granulite		T1	38.1	0.13	20.85	0	0	26.64	1.28	6.23	0.31	0.2	0	100.72
385	8141As	Grt	Clarke Head granulite		T1	38.71	0.11	20.83	0	0	27.16	1.34	6.19	0.37	0.14	0	100.86
386	8141As	Grt	Clarke Head granulite		T1	38.85	0	20.86	0	0	27.25	1.4	6.21	0.45	0.18	0	101.17
387	8141As	Grt	Clarke Head granulite		T1	38.74	0.15	20.82	0	0	26.56	1.38	6.33	0.41	0.25	0	100.78
388	8141As	Grt	Clarke Head granulite		T1	38.82	0.12	20.93	0	0.09	26.77	1.97	5.73	0.19	0.14	0	100.76
389	8141As	Grt	Clarke Head granulite		T2	38.86	0	21.31	0	0	25.6	1.29	6.89	0.23	0.27	0	100.24
390	8141As	Grt	Clarke Head granulite		T2	38.97	0.17	21.16	0	0	25.78	1.35	6.73	0.29	0.21	0	100.64
391	8141As	Grt	Clarke Head granulite		T2	38.62	0.19	21.38	0	0	25.88	1.41	6.65	0.27	0	0	100.63
392	8141As	Grt	Clarke Head granulite		T2	38.8	0	21.08	0	0.08	25.98	1.29	6.51	0.12	0	0	99.84
393	8141As	Grt	Clarke Head granulite		T2	38.5	0.11	21.07	0	0	26.02	1.37	5.98	0.23	0.17	0.04	99.69
394	8141As	Grt	Clarke Head granulite		CORE	38.37	0.18	20.3	0	0.08	26.85	1.35	6.85	0.25	0	0	100.01
395	8141As	Grt	Clarke Head granulite		Rim	38.17	0	20.02	0	0	26.54	1.42	6.66	0.2	0	0	99.05
396	8141As	Grt	Clarke Head granulite			38.11	0	20.08	0	0.08	26.36	1.36	6.71	0.32	0.15	0	99.18

* = Traverse

Table 10. Electron microprobe chemical analyses of Fe-Ti oxides from potential source areas.

Locality (* see key)	Rock-type	Sample No.	Mineral	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	K_2O	Cr_2O_3	V_2O_5	ZnO	Total
bap	to	y20=1	ilm	0.73	49.28	1.11	32.34	14.66	0.13	0.10	0.00	0.41	2.15	0.19	101.08
bap	to	y20=2	he	1.74	1.19	2.47	81.17	0.00	0.65	0.08	0.00	0.37	0.52	0.07	88.26
bap	to	y20=3	he	1.07	0.94	6.88	81.57	0.00	0.27	0.08	0.00	0.37	0.52	0.19	91.89
bap	to	y17=1	ilm	0.07	51.12	0.00	42.64	4.69	0.06	0.10	0.00	0.41	2.09	0.19	101.37
bap	to	y20=4	ilm	0.14	50.29	0.08	43.75	4.13	0.10	0.10	0.00	0.44	2.08	0.16	101.27
bap	to	y17=2	ilm	0.40	50.20	0.11	41.68	4.79	0.00	0.21	0.00	0.44	2.00	0.17	100.00
bap	to	y17=3	ilm	0.10	50.48	0.00	43.73	4.46	0.00	0.00	0.00	0.41	1.67	0.15	101.00
bap	to	y2=1	ilm	0.13	50.23	0.00	44.04	4.37	0.14	0.00	0.00	0.44	1.68	0.18	101.21
bap	to	y2=2	ilm	0.08	50.95	0.00	40.73	7.01	0.11	0.18	0.00	0.42	1.78	0.19	101.45
bap	to	y2=3	ilm	0.11	49.75	0.00	41.81	6.41	0.00	0.14	0.00	0.45	1.92	0.19	100.78
wdp	mg	y8=1	ilm	0.29	49.79	0.10	30.40	16.86	0.09	0.06	0.00	0.41	1.64	0.17	99.81
wdp	mg	y8=2	ilm	0.00	50.21	0.00	40.44	7.17	0.11	0.08	0.00	0.41	1.82	0.17	100.41
wdp	mg	y8=3	ilm	0.13	50.83	0.15	40.36	7.30	0.00	0.25	0.00	0.41	1.79	0.18	101.40
wdp	mg	y8=4	ilm	0.07	51.39	0.00	41.53	5.73	0.00	0.35	0.00	0.42	1.67	0.16	101.32
c21	gr	c21=1	mgt	0.00	0.21	93.37	0.28	0.02	0.12	0.00	0.22	0.00	0.00	0.00	94.28
c21	gr	c21=2	ilm	0.00	44.35	0.00	42.89	8.79	0.08	0.06	0.00	0.15	0.00	0.00	96.32
c20	gr	c20=1	mgt	0.00	0.16	0.08	91.73	0.30	0.02	0.00	0.00	0.00	0.00	0.00	92.29
c20	gr	c21=3	ilm	0.00	49.77	0.06	41.58	4.67	0.04	0.00	0.00	0.00	0.00	0.00	96.12
moh	gd	6950=1	mgt	0.00	0.00	0.04	93.31	0.11	0.00	0.08	0.00	0.25	0.00	0.00	93.79
moh	gd	6950=2	mgt	0.00	0.11	0.05	94.73	0.12	0.00	0.11	0.00	0.27	0.00	0.00	95.39
moh	gd	6950=3	mgt	0.00	0.14	0.07	92.27	0.10	0.00	0.13	0.00	0.06	0.00	0.00	92.77
moh	gd	6960=1	he	0.00	0.39	0.07	82.68	0.09	0.00	0.08	0.00	0.14	0.00	0.00	83.45
moh	gd	6960=2	he	0.00	0.14	0.00	86.94	0.09	0.00	0.05	0.00	0.11	0.00	0.00	87.33
jae	gr	6	lim	6.38	0.00	0.26	72.91	0.21	0.31	0.00	0.00	0.04	0.00	0.00	80.11
jae	gr	7	lim	7.99	0.00	0.46	69.60	0.33	0.38	0.00	0.00	0.46	0.00	0.00	78.83
jae	gr	8	goe	12.07	0.23	3.86	45.68	0.66	0.42	0.33	1.17	0.01	0.00	0.00	64.43
gae	gr	9	goe	3.13	0.28	2.89	71.90	0.55	0.20	0.29	0.02	0.02	0.00	0.00	79.46
oji	lgd	7600=1	rut	0.30	84.00	0.26	8.47	0.04	0.00	0.09	0.00	0.06	0.00	0.00	93.22
moh	gd	6970=1	he	0.00	0.10	0.06	88.40	0.03	0.00	0.06	0.04	0.00	0.00	0.00	88.69
moh	gd	6970=2	mgt	0.00	0.10	0.07	91.84	0.06	0.00	0.06	0.05	0.00	0.00	0.00	92.18
moh	gd	6970=3	mgt	0.00	0.11	0.07	92.28	0.07	0.00	0.06	0.04	0.00	0.00	0.00	92.63
moh	gd	6970=4	mgt	0.00	0.12	0.05	91.81	0.07	0.00	0.10	0.05	0.00	0.00	0.00	92.20
moh	gd	6970=5	he	0.00	0.11	0.04	89.23	0.00	0.00	0.08	0.06	0.00	0.00	0.00	89.52
moh	gd	6970=6	mgt	0.00	0.13	0.07	92.28	0.05	0.00	0.05	0.03	0.00	0.00	0.00	92.61
moh	gd	6970=7	he	0.00	0.09	0.05	88.42	0.03	0.00	0.08	0.03	0.00	0.00	0.00	88.68
moh	gd	6970=8	mgt	0.00	0.11	0.06	92.03	0.08	0.00	0.05	0.04	0.02	0.00	0.00	92.39
moh	gd	6970=9	he	0.00	0.18	0.06	88.74	0.05	0.00	0.04	0.04	0.00	0.00	0.00	89.11
moh	gd	6970=10	mgt	0.00	0.10	0.06	93.31	0.05	0.00	0.07	0.03	0.01	0.00	0.00	93.63
moh	gd	6970=11	he	0.00	0.14	0.05	88.91	0.06	0.00	0.04	0.02	0.00	0.00	0.00	89.22
moh	gd	6970=12	mgt	0.00	0.12	0.05	92.83	0.06	0.00	0.06	0.07	0.01	0.00	0.00	93.16
moh	gd	6970-13	he	0.00	0.13	0.05	90.64	0.02	0.00	0.05	0.04	0.00	0.00	0.00	90.93
moh	gd	6970=21	mgt	0.00	0.11	0.05	91.71	0.00	0.00	0.06	0.07	0.00	0.00	0.00	92.00
moh	gd	6970=22	he	0.00	0.09	0.05	89.91	0.02	0.00	0.04	0.05	0.00	0.00	0.00	90.16
moh	gd	6970=23	mgt	0.00	0.12	0.06	92.66	0.00	0.00	0.05	0.04	0.00	0.00	0.00	92.93
moh	gd	6970=24	mgt	0.00	0.09	0.04	91.89	0.00	0.00	0.07	0.05	0.00	0.00	0.00	92.14
moh	gd	6970=25	mgt	0.00	0.11	0.05	92.64	0.00	0.00	0.07	0.06	0.00	0.00	0.00	92.93
moh	gd	6970=26	mgt	0.00	0.11	0.06	92.24	0.07	0.00	0.05	0.04	0.00	0.00	0.00	92.57
moh	gd	6970=27	he	0.00	0.30	0.04	88.06	0.04	0.00	0.11	0.05	0.00	0.00	0.00	88.60
moh	gd	6970-28	he	0.00	0.12	0.07	90.80	0.00	0.00	0.09	0.04	0.00	0.00	0.00	91.12
moh	gd	6970=29	he	0.00	0.11	0.06	85.52	0.02	0.00	0.08	0.05	0.00	0.00	0.00	85.84
moh	gd	6940=10	mgt	0.00	0.16	0.04	92.62	0.14	0.00	0.07	0.05	0.00	0.00	0.00	93.06

Table 10. Electron microprobe chemical analyses of Fe-Ti oxides from potential source areas (cont'd).

moh	gd	6940=11	mgt	0.00	0.16	0.04	92.76	0.13	0.01	0.06	0.05	0.00	0.00	0.00	93.21
moh	gd	6940=12	mgt	0.00	0.15	0.03	94.11	0.11	0.00	0.04	0.05	0.00	0.00	0.00	94.49
moh	gd	6940=13	mgt	0.00	0.14	0.04	91.23	0.15	0.03	0.03	0.06	0.00	0.00	0.00	91.58
moh	gd	6940=14	mgt	0.00	0.15	0.04	93.69	0.16	0.01	0.05	0.03	0.00	0.00	0.00	94.13
mallard	gr	8680=1	mgt	0.23	4.74	0.39	86.68	0.39	0.00	0.00	0.00	0.00	0.00	0.00	92.43
newcom	sgr	dio19=1	ilm	0.39	53.03	0.00	40.89	6.30	0.00	0.00	0.00	0.00	0.00	0.00	100.61
newcom	sgr	dio19=2	ilm	0.00	51.53	0.00	38.16	8.99	0.00	0.00	0.00	0.00	0.00	0.00	98.68
newcm	sgr	dio19=3	rut	0.35	98.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.16
newcom	sgr	dio19=4	rut	0.00	100.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.08
newcom	sgr	di030=1	ilm	0.22	51.72	0.00	41.46	4.49	0.00	0.00	0.00	0.00	0.00	0.00	97.89
newcom	sgr	di030=2	ilm	0.24	51.59	0.00	37.66	8.52	0.00	0.00	0.00	0.00	0.00	0.00	98.01
cobprec	cgdt	6987=1	ilm	3.33	0.00	0.00	74.69	0.00	0.00	0.30	0.00	0.00	0.00	0.00	78.32
cobprec	cgdt	6987=2	ilm	3.01	0.00	0.00	72.41	0.00	0.25	0.50	0.00	0.00	0.00	0.00	76.17
cobprec	cgdt	6987=3	ilm	5.20	0.00	1.81	70.97	0.00	0.00	1.39	0.00	0.00	0.00	0.00	79.38
cobprec	cgdt	6987=4	ilm	3.30	0.00	0.59	71.01	0.00	0.00	0.87	0.00	0.00	0.00	0.00	75.76
cobprec	gd	6633=1	ilm	0.31	47.85	0.00	41.30	6.76	0.00	0.31	0.00	0.00	0.00	0.00	96.52
cobprec	gd	6633=2	ilm	0.34	47.16	0.00	40.71	6.93	0.00	0.22	0.00	0.00	0.00	0.00	95.35
cobprec	gd	6633=3	ilm	0.00	50.69	0.00	41.49	6.75	0.00	0.26	0.00	0.00	0.00	0.00	99.19
cobprec	gd	6633=4	ilm	0.00	49.84	0.00	40.66	6.45	0.00	0.22	0.00	0.00	0.00	0.00	97.16
cobprec	gd	6606=1	mgt	1.27	0.00	0.00	92.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.78
cobprec	mggr	6625=1	ilm	4.85	0.00	1.85	67.82	0.00	0.51	0.00	0.00	0.00	0.00	0.00	75.23
cobprec	mggr	6625=2	ilm	6.94	1.18	0.00	71.38	0.00	0.00	0.21	0.00	0.00	0.00	0.00	79.71
cobprec	mggr	6625=3	mgt	0.33	0.00	0.00	93.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	94.23
cobprec	mggr	6625=4	mgt	0.00	0.00	0.00	94.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	94.79
cobprec	mggr	6625=5	ilm	5.61	0.00	1.71	70.43	0.00	0.00	0.16	0.00	0.00	0.00	0.00	77.92
cobprec	mggr	6625=6	ilm	3.36	0.00	0.50	75.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79.73
cobprec	mggr	6625=7	ilm	2.97	0.00	1.00	69.87	0.00	0.00	0.14	0.00	0.00	0.00	0.00	74.26
cobprec	mggr	6625=8	ilm	3.99	0.00	2.08	61.94	0.00	0.00	0.27	0.00	0.00	0.00	0.00	68.28
cobprec	mggr	6625=9	mgt	2.81	0.00	0.00	73.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	75.88
wentw	fgdt	6390=1	mgt	1.74	15.40	0.48	72.17	2.14	0.43	0.25	0.16	0.00	0.00	0.00	92.77
wentw	fgdt	6390=2	mgt	0.73	20.79	0.27	66.06	3.64	0.00	0.00	0.00	0.00	0.00	0.00	91.49
wentw	fgdt	6390=3	mgt	5.63	22.39	2.10	57.74	3.88	1.97	0.00	0.74	0.00	0.00	0.00	94.45
wentw	mgdt	6384=1	ilm	0.23	48.91	0.00	45.51	2.53	0.00	0.00	0.00	0.00	0.00	0.00	97.18
wentw	mgdt	6384=2	ilm	0.23	48.75	0.00	45.78	2.57	0.00	0.00	0.00	0.00	0.00	0.00	97.03
wentw	mgdt	6384=3	ilm	0.25	47.81	0.00	45.72	2.47	0.00	0.00	0.00	0.00	0.00	0.00	96.25
wentw	mgdt	6384=4	ilm	0.26	47.82	0.00	44.40	3.12	0.00	0.00	0.00	0.00	0.00	0.00	95.60
wentw	mgdt	6384=5	ilm	0.00	48.71	0.00	46.59	1.86	0.00	0.00	0.00	0.00	0.00	0.00	97.16
wentw	mgdt	6384=6	ilm	0.22	48.75	0.00	46.64	1.97	0.00	0.00	0.00	0.00	0.00	0.00	97.28
wentw	mgdt	6384=7	ilm	0.19	48.26	0.00	45.41	2.82	0.00	0.00	0.00	0.00	0.00	0.00	96.68
wentw	mgdt	6384=8	ilm	0.00	49.81	0.37	44.33	2.87	0.00	0.00	0.00	0.00	0.00		97.38
wenrw	mgdt	6384=9	ilm	0.23	48.35	0.00	45.48	1.73	0.21	0.00	0.00	0.00	0.00	0.00	96.00
wentw	mgdt	6384=10	he	0.00	11.09	5.27	75.11	0.36	0.00	0.00	0.00	0.00	0.00	0.00	91.83
wentw	mgpoo	7705=1	ilm	4.37	45.24	1.35	38.99	5.41	1.21	1.51	0.28	0.00	0.00	0.00	98.34
wentw	mgpodt	7705=2	mgt	0.53	22.08	0.21	67.84	1.99	0.00	0.35	0.00	0.00	0.00	0.00	93.00
wentw	mgpodt	7705=3	mgt	0.24	20.18	0.00	60.99	2.69	0.20	0.00	0.00	0.00	0.00	0.00	93.30
wentw	mgpod	7705=5	mgt	1.60	14.03	0.67	72.06	3.44	0.44	0.58	0.17	0.00	0.00	0.00	92.99
wentw	mgpodt	7705=6	mgt	0.28	17.11	0.00	72.60	2.49	0.00	0.18	0.00	0.00	0.00	0.00	92.66
wentw	mgpodt	7705=7	ilm	0.00	49.23	0.00	45.06	1.49	0.00	0.00	0.00	0.00	0.00	0.00	95.78
wentw	mgpodt	7705=8	he	0.00	2.64	0.57	85.18	0.00	0.00	0.00	0.00	0.38	0.00	0.00	83.77
wentw	mgpodt	7705=9	he	0.37	2.49	0.22	86.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	89.48
wentw	mgpodt	7705=10	he	0.22	2.18	0.00	85.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.22
wentw	mggd	7712=1	ilm	0.28	48.29	0.00	47.33	1.91	0.00	0.00	0.00	0.00	0.00	0.00	97.81
wentw	mggd	7712=2	ilm	0.00	48.10	0.00	47.60	1.80	0.00	0.00	0.00	0.00	0.00	0.00	97.50
dbfm	ba	6562=1	ilm	0.26	49.57	0.00	43.00	5.64	0.00	0.00	0.00	0.00	0.00	0.00	98.47
dbfm	ba	7732=1	mgt	1.22	29.56	0.59	58.23	1.57	0.00	1.07	0.00	0.49	0.00	0.00	92.73

Table 10. Electron microprobe chemical analyses of Fe-Ti oxides from potential source areas (cont'd).

dbfm	ba	7732=2	he	3.21	0.88	1.07	77.62	0.36	0.00	0.45	0.00	0.00	0.00	0.00	83.59
fl	ba	6059=1	he	2.36	0.37	0.61	82.69	0.00	0.00	0.16	0.00	0.00	0.00	0.00	86.19
mrgr	vein	4819=1	ilm	1.17	5.78	0.63	78.18	0.58	0.00	0.90	0.00	0.10	0.00	0.00	86.49
mrgr	vein	4819=2	ilm	4.96	0.14	1.33	76.22	0.26	0.26	0.12	0.00	0.09	0.00	0.00	83.38
mrgr	vein	4819=3	ilm	2.72	38.47	0.78	40.07	7.10	0.00	0.65	0.00	0.08	0.00	0.00	89.87
mrgr	vein	4819=4	ilm	0.87	55.07	0.25	25.74	8.37	0.01	0.98	0.00	0.06	0.00	0.00	91.35
mrgr	vein	4819=5	he	0.00	8.04	0.13	79.95	1.00	0.00	0.06	0.00	0.12	0.00	0.00	89.30
mrgr	vein	4819=6	he	0.00	3.03	0.13	83.42	0.31	0.00	0.06	0.00	0.11	0.00	0.00	87.06
mrgr	vein	4818=1	he	0.00	0.32	0.13	87.42	0.26	0.00	0.07	0.00	0.10	0.00	0.00	88.30
mggr	vein	4818=2	mgt	0.00	7.22	0.13	78.97	2.52	0.00	0.08	0.00	0.13	0.00	0.00	89.05
mrgr	vein	4818=3	ru	0.77	93.36	0.83	2.05	0.09	0.31	0.12	0.34	0.00	0.00	0.00	97.87
mrgr	vein	4818=4	ru	2.30	90.39	1.42	3.02	0.11	0.75	0.15	0.37	0.05	0.00	0.00	98.56
cabdyke	rhy	1817=1	goe	0.00	1.41	0.21	81.07	0.70	0.00	0.07	0.00	0.13	0.00	0.00	83.59
cabdyke	rhy	1817=2	mgt	0.00	8.79	0.11	81.54	0.35	0.02	0.06	0.00	0.11	0.00	0.00	90.98
cabdyke	rhy	1817=3	goe	0.00	0.18	0.15	84.39	0.21	0.00	0.09	0.00	0.11	0.00	0.00	85.11
cabdyke	rhy	1817=4	goe	0.00	0.17	0.09	86.43	0.19	0.00	0.05	0.00	0.11	0.00	0.00	87.04
cabdyke	rhy	1817=5	goe	0.00	0.15	0.15	85.93	0.21	0.00	0.07	0.00	0.12	0.00	0.00	86.63
cabdyke	rhy	1817=6	goe	0.00	3.41	0.11	82.42	1.34	0.00	0.06	0.00	0.13	0.00	0.00	87.47
php	gr	4699=1	ilm	0.32	54.27	0.00	31.00	1.76	0.00	0.21	0.00	0.00	0.00	0.00	87.56
php	gr	4699=2	ilm	0.48	55.11	0.19	13.28	22.43	0.00	0.00	0.00	0.00	0.00	0.00	91.47
php	gr	4681=1	ilm	0.30	48.04	0.00	40.16	4.25	0.00	0.00	0.00	0.00	0.00	0.00	92.75
php	gr	4697=1	ilm	0.23	44.40	0.00	41.58	6.79	0.13	0.11	0.00	0.00	0.00	0.00	93.24
php	gr	4697=2	he	0.30	2.07	0.00	87.14	0.36	0.22	0.00	0.00	0.00	0.00	0.00	90.09
php	gr	4697=3	he	0.42	0.48	0.00	88.84	0.00	0.21	0.00	0.00	0.00	0.00	0.00	89.95
mr	anor	8186c=1	ilm	0.21	37.66	0.00	56.84	2.24	0.00	0.00	0.00	0.00	0.00	0.00	97.06
mr	anor	8186=2	mgt	0.00	0.32	0.34	90.60	3.11	0.00	0.00	0.00	0.00	0.00	0.00	94.37
mr	anor	8189=1	ilm	0.00	51.22	0.00	43.96	0.65	1.51	0.00	0.00	0.00	0.00	0.00	97.34
mr	anor	8189=2	mgt	0.22	1.74	1.07	85.63	0.00	0.00	0.00	0.00	0.69	0.00	0.00	89.34
mr	anor	8189=3	ilm	0.00	51.39	0.00	44.17	0.62	1.28	0.00	0.00	0.00	0.00	0.00	97.47
mr	anor	8189=4	mgt	0.00	1.99	0.92	86.33	0.00	0.00	0.00	0.00	0.63	0.00	0.00	89.87
mr	anor	8189=5	ilm	0.00	51.83	0.00	44.28	0.65	1.36	0.00	0.00	0.00	0.00	0.00	98.10
mr	anor	8189=6	he	0.34	0.00	0.00	87.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.10
mr	anor	8189=7	ilm	0.00	50.19	0.00	44.72	0.42	1.37	0.00	0.00	0.00	0.00	0.00	96.70
mr	anor	8189=8	he	0.00	2.33	0.93	83.71	0.00	0.00	0.00	0.00	1.21	0.00	0.00	88.18
mr	anor	8189=9	ilm	0.00	49.54	0.00	44.50	0.41	2.21	0.00	0.00	0.00	0.00	0.00	97.50
mr	anor	8189=10	mgt	0.20	1.88	0.99	88.75	0.00	0.27	0.00	0.00	0.46	0.00	0.00	92.55
mr	anor	8127=1	ilm	0.00	51.87	0.00	46.36	0.84	0.86	0.00	0.00	0.00	0.00	0.00	99.93
mr	anor	8127=2	mgt	0.00	0.31	0.38	90.60	0.09	0.14	0.00	0.00	0.28	0.84	0.07	92.33
mr	anor	8130=1	ilm	0.00	49.17	0.00	48.85	0.12	0.88	0.00	0.00	0.00	0.10	0.15	99.27
mr	anor	8130=2	mgt	0.00	0.24	0.55	90.25	0.03	0.00	0.00	0.00	0.24	0.90	0.23	92.44
mr	anor	8130=3	ilm	0.00	52.58	0.00	45.04	2.25	0.00	0.00	0.00	0.00	0.00	0.00	99.87
mr	anor	8130=4	mgt	0.00	0.20	0.29	90.57	0.00	0.05	0.00	0.00	0.37	0.94	0.07	92.49
mr	anor	8085=1	ilm	0.00	48.49	0.00	49.14	1.56	0.00	0.00	0.00	0.00	0.00	0.00	99.19
mr	anor	8085=2	mgt	0.00	0.00	0.00	93.01	0.00	0.00	0.00	0.00	1.05	0.70	0.00	94.76
mr	anor	8185=3	ilm	0.21	43.14	0.00	52.03	3.08	0.00	0.00	0.00	0.00	0.00	0.00	98.46
mr	anor	8185=4	mgt	0.26	0.00	0.00	91.92	0.00	0.00	0.00	0.00	1.04	0.60	0.00	93.82
mr	anor	8187=1	ilm	0.21	48.68	0.00	43.62	4.95	0.00	0.00	0.00	0.00	0.00	0.00	97.46
mr	anor	8187=2	mgt	0.00	0.00	86.42	0.00	0.00	0.00	0.00	0.00	2.79	2.08	0.00	91.29
mr	anor	8187=3	ilm	0.19	48.75	0.00	43.64	5.08	0.00	0.00	0.00	0.00	0.00	0.00	97.66
mr	anor	8187=4	mgt	0.22	0.00	0.24	86.28	0.00	0.00	0.00	0.00	2.72	2.05	0.00	91.51
mr	anor	8189=11	ilm	0.00	51.10	0.00	45.20	0.69	1.97	0.00	0.00	0.00	0.00	0.00	98.96
mr	anor	8189=12	mgt	0.22	10.82	1.06	90.51	0.00	0.00	0.00	0.00	0.41	0.00	0.00	94.02
mr	anor	8189=13	ilm	0.00	51.35	0.00	45.63	0.92	1.50	0.00	0.00	0.00	0.00	0.00	99.40
mr	anor	8189=14	mgt	0.00	4.17	1.01	87.35	0.00	0.00	0.00	0.00	0.35	0.00	0.00	92.88
bassr	mgtdep	8252=1	mgt	0.40	0.00	0.00	92.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.17

Table 10. Electron microprobe chemical analyses of Fe-Ti oxides from potential source areas (cont'd).

bassr	mgtdep	8252=2	mgt	0.41	0.00	0.00	93.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.51
bassr	mgtdep	8252=3	mgt	0.00	0.00	0.00	91.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	91.94
bassr	mgtdep	8252=4	mgt	0.00	0.00	0.00	93.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.20
bassr	mgtdep	8252=5	mgt	0.50	0.00	0.00	92.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.39
bassr	mgtdep	8252=6	mgt	0.35	0.00	0.00	92.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	92.91
bassr	mgtdep	8252=7	mgt	0.45	0.00	0.00	92.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.11
bassr	mgtdep	8252=8	mgt	0.35	0.00	0.00	93.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.35
bassr	mgtdep	8253=1	mgt	0.37	0.00	0.00	93.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.51
bassr	mgtdep	8253=2	mgt	0.00	0.00	0.00	93.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.14
bassr	mgtdep	8254=1	mgt	0.00	0.00	0.00	90.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.38
bassr	mgtdep	8257=1	mgt	0.29	0.00	0.00	92.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.25
bassr	mgtdep	8257=2	mgt	0.63	0.00	0.23	92.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.78
bassr	mgtdep	8257=3	mgt	0.37	0.00	0.00	92.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.02
germt	mgtdep	8236=1	mgt	0.00	0.00	2.94	88.50	0.00	1.51	0.00	0.00	0.00	0.00	0.00	93.34
germt	mgtdep	8236=2	mgt	0.00	0.00	0.00	90.14	0.00	2.46	0.00	0.00	0.00	0.00	0.00	92.60
grmt	mgtdep	8236=3	mgt	0.00	0.00	0.00	89.40	0.00	2.68	0.00	0.00	0.00	0.00	0.00	92.08
germt	mgtdep	8236=4	mgt	0.25	0.35	0.96	92.12	0.00	1.11	0.00	0.00	0.00	0.00	0.00	94.79
gremt	mgtdep	8236=5	mgt	2.32	0.00	0.00	88.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.42
germt	mgtdep	8236=6	mgt	1.53	0.29	1.19	88.95	0.00	1.23	0.24	0.00	0.00	0.00	0.00	93.43
germt	mgtdep	8237=1	mgt	0.00	0.00	0.00	92.17	0.00	1.37	0.00	0.00	0.00	0.00	0.00	93.54
germt	mgtdep	8237=2	mgt	0.30	0.00	0.00	89.04	0.00	4.82	0.00	0.00	0.00	0.00	0.00	94.15
germt	mgtdep	8237=3	mgt	0.00	0.00	0.34	89.45	0.00	4.94	0.00	0.00	0.00	0.00	0.00	94.73
germt	mgtdep	8237=4	mgt	0.21	0.00	0.00	88.80	0.00	4.47	0.00	0.00	0.00	0.00	0.00	93.48
germt	mgtdep	8237=5	mgt	0.00	0.00	0.00	92.07	0.00	0.15	0.00	0.00	0.00	0.00	0.00	91.42
germ.	mgtdep	8237=6	mgt	5.36	0.00	0.21	84.98	0.00	0.47	0.28	0.00	0.00	0.00	0.00	91.29
germt	mgtdep	8237=7	mgt	0.00	0.00	0.21	86.67	0.00	4.67	0.00	0.00	0.00	0.21	0.00	91.77
germt	mgtdep	8241=1	mgt	0.00	0.18	0.28	85.48	0.00	0.37	0.00	0.00	0.00	0.36	0.00	86.66
germt	mgtdep	8241=2	mgt	0.79	0.29	0.00	87.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.79
germt	mgtdep	8241=3	mgt	0.96	0.00	0.00	87.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.82
germt	mgtdep	8241=4	mgt	0.61	0.00	0.00	89.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	89.97
germt	mgtdep	8241=5	mgt	0.36	0.00	0.00	88.93	0.00	4.65	0.00	0.00	0.00	0.00	0.00	83.94
germt	mgtdep	8241=6	mgt	0.00	0.00	0.00	90.43	0.00	2.06	0.16	0.00	0.00	0.00	0.00	92.64
germt	mgtdep	8241=7	mgt	0.00	0.00	0.00	90.27	0.00	2.53	0.00	0.00	0.00	0.00	0.00	92.80
germt	mgtdep	8242=1	mgt	0.00	0.00	0.00	91.05	0.00	1.12	0.00	0.00	0.00	0.00	0.00	92.17
germt	mgtdep	8242=2	mgt	0.00	0.00	0.00	91.56	0.00	1.38	0.00	0.00	0.00	0.00	0.00	92.94
germt	mgtdep	8242=3	mgt	0.00	0.00	0.00	91.89	0.00	1.37	0.00	0.00	0.00	0.00	0.00	93.06
germt	mgtdep	8246=1	mgt	0.00	0.00	0.00	91.97	0.00	0.91	0.00	0.00	0.00	0.28	0.00	93.16
germt	mgtdep	8247=1	mgt	0.00	0.00	0.00	88.77	0.00	3.94	0.00	0.00	0.00	0.32	0.00	93.03
germt	mgtdep	8242=4	mgt	0.26	0.00	0.00	89.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	89.66
germt	mgtdep	8242=5	mgt	0.32	0.31	0.00	89.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.54
germt	mgtdep	8242=6	mgt	0.44	0.48	0.00	90.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.93
germt	mgtdep	8242=7	mgt	0.35	0.00	0.00	91.77	0.00	2.73	0.00	0.00	0.00	0.00	0.00	94.85
germt	mgtdep	8242=8	mgt	0.81	0.00	88.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	89.37
germt	mgtdep	8242=9	mgt	0.25	0.00	0.00	92.75	0.00	1.46	0.00	0.00	0.00	0.00	0.00	94.46
germt	mgtdep	8246=1	mgt	0.44	0.00	0.00	87.39	0.00	0.61	0.00	0.00	0.00	0.40	0.00	88.84
germt	mgtdep	8246=2	mgt	0.00	0.00	0.00	89.10	0.00	0.46	0.00	0.00	0.00	0.40	0.00	89.96
germt	mgtdep	8246=3	mgt	0.00	0.00	0.00	89.79	0.00	0.37	0.00	0.00	0.00	0.38	0.00	90.54
germt	mgtdep	8246=4	mgt	0.32	0.00	0.00	91.91	0.00	1.35	0.00	0.00	0.00	0.37	0.00	93.95
germt	mgtdep	8246=5	mgt	0.22	0.00	0.00	92.20	0.00	2.27	0.00	0.00	0.00	0.57	0.00	95.26
germt	mgtdep	8246=6	mgt	0.00	0.00	0.00	90.71	0.00	0.57	0.00	0.00	0.00	0.00	0.00	91.28
germt	mgtdep	8246=7	mgt	0.22	0.00	0.00	93.75	0.00	0.99	0.00	0.00	0.00	0.37	0.00	95.33
germt	mgtdep	8246=8	mgt	0.00	0.00	0.00	92.10	0.00	1.97	0.00	0.00	0.00	0.56	0.00	94.63
germt	mgtdep	8246=9	mgt	0.25	0.00	0.00	93.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.83
germt	mgtdep	8247=1	mgt	0.00	0.00	0.00	90.03	0.00	4.25	0.00	0.00	0.00	0.00	0.00	94.28
germt	mgtdep	8247=2	mgt	0.39	0.00	0.00	88.13	0.00	0.00	0.00	0.00	0.00	0.32	0.00	88.84

Table 10. Electron microprobe chemical analyses of Fe-Ti oxides from potential source areas (cont'd).

germt	mgtdep	8247=3	mgt	0.22	0.00	0.00	91.43	0.00	2.14	0.00	0.00	0.00	0.00	0.00	93.79
germt	mgtdep	8247=4	mgt	0.31	0.00	0.00	87.71	0.00	0.00	0.00	0.00	0.00	0.27	0.00	88.29
rawdon	sed	1004=1	ilm	0.38	53.81	0.00	36.36	9.99	0.00	0.00	0.00	0.00	0.00	0.00	100.54
rawdon	sed	1014b=1	ilm	0.26	51.13	0.00	33.86	14.17	0.00	0.00	0.00	0.00	0.00	0.00	99.42
rawdon	sed	1014b=2	ilm	0.50	50.81	0.00	32.41	14.19	0.00	0.00	0.00	0.00	0.00	0.00	97.91
rawdon	sed	1016=1	ilm	1.25	52.13	0.00	40.68	5.99	0.00	0.00	0.00	0.00	0.00	0.00	100.10
rawdon	sed	1016=2	ilm	0.16	52.75	0.00	41.41	5.95	0.00	0.00	0.00	0.00	0.00	0.00	100.26
rawdon	sed	1017=1	ilm	0.28	52.63	0.00	36.67	10.08	0.00	0.00	0.00	0.00	0.00	0.00	99.65
rawdon	sed	1019=1	ilm	0.16	53.17	0.00	37.55	10.01	0.00	0.00	0.00	0.00	0.00	0.00	100.88
rawdon	sed	1019=2	ilm	1.39	51.42	0.00	35.72	10.01	0.00	0.00	0.00	0.00	0.00	0.00	99.62
rawdon	sed	1019=3	ilm	0.35	52.04	0.00	34.87	11.64	0.00	0.00	0.00	0.00	0.00	0.00	98.90
rawdon	sed	1019=4	ilm	0.19	53.24	0.00	37.29	9.77	0.00	0.00	0.00	0.00	0.00	0.00	100.47
rawdon	sed	1023=1	ilm	0.00	53.29	0.00	40.98	6.18	0.00	0.00	0.00	0.00	0.00	0.00	100.45
rawdon	sed	1023=2	ilm	0.24	51.92	0.00	38.54	7.68	0.00	0.00	0.00	0.00	0.00	0.00	98.38
rawdon	sed	1029=1	ilm	0.21	53.33	0.00	41.66	5.40	0.00	0.00	0.00	0.00	0.00	0.00	100.60
rawdon	sed	1029=2	ilm	0.00	52.94	0.00	41.71	5.33	0.00	0.00	0.00	0.00	0.00	0.00	99.98
rawdon	sed	1029=3	ilm	0.16	52.45	0.00	41.48	5.76	0.00	0.00	0.00	0.00	0.00	0.00	99.90
rawdon	sed	1030=1	ilm	0.22	53.09	0.00	29.79	17.22	0.00	0.00	0.00	0.00	0.00	0.00	100.33
rawdon	sed	1030=2	ilm	0.13	52.67	0.00	29.87	16.62	0.00	0.00	0.00	0.00	0.00	0.00	99.29
rawdon	sed	1030=3	ilm	0.17	52.99	0.00	30.18	17.12	0.00	0.00	0.00	0.00	0.00	0.00	100.48
rawdon	sed	1030=4	ilm	0.14	52.87	0.00	26.45	20.49	0.00	0.00	0.00	0.00	0.00	0.00	100.00
rawdon	sed	1030=5	ilm	0.22	51.99	0.00	29.98	17.26	0.00	0.00	0.00	0.00	0.00	0.00	99.45
rawdon	sed	1052=1	ilm	0.21	52.63	0.00	36.44	10.92	0.00	0.00	0.00	0.00	0.00	0.00	100.20
rawdon	sed	1052=2	ilm	0.20	52.64	0.00	34.13	12.21	0.00	0.00	0.00	0.00	0.00	0.00	99.18
rawdon	sed	1011=1	mgt	0.00	0.00	0.00	94.05	0.00	0.00	0.00	0.00	0.29	0.25	0.00	94.59
rawdon	sed	1011=2	mgt	0.16	0.00	0.00	93.63	0.00	0.00	0.00	0.00	0.22	0.32	0.00	94.33
rawdon	sed	1011=3	mgt	0.17	0.00	0.00	89.94	0.00	0.00	0.00	0.00	0.00	0.23	0.00	90.33
rawdon	sed	1011=4	mgt	0.27	0.00	0.00	92.22	0.00	0.00	0.16	0.00	0.00	0.25	0.00	92.91
rawdon	sed	1011=5	mgt	0.25	0.00	0.00	91.18	0.00	0.00	0.16	0.00	0.17		0.00	91.76
rawdon	sed	1014b=1	mgt	0.00	0.00	0.00	93.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.78
rawdon	sed	1014b=2	mgt	0.19	0.00	0.00	93.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.39
rawdon	sed	1014b=3	mgt	0.27	0.00	0.00	93.34	0.00	0.00	0.00	0.00	0.18	0.00	0.00	93.80
rawdon	sed	1014b=4	mgt	0.25	0.00	0.00	93.75	0.00	0.00	0.00	0.00	0.18	0.00	0.00	94.18
rawdon	sed	1014b=5	mgt	0.26	0.00	0.00	92.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.26
rawdon	sed	1000=1	rut	1.55	98.72	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.78
rawdon	sed	1000=2	rut	0.45	98.36	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.08
rawdon	sed	1000=3	rut	0.16	97.63	0.00	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.01
rawdon	sed	1000=4	rut	0.30	99.23	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.40
rawdon	sed	1000=5	rut	0.54	99.19	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.08
rawdon	sed	1001=1	rut	0.21	98.04	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.15
rawdon	sed	1001=2	rut	0.24	95.86	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	96.44
rawdon	sed	1001=3	rut	0.31	96.37	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	97.32
rawdon	sed	1001=4	rut	0.34	96.56	0.13	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	97.27
rawdon	sed	1001=5	rut	0.23	96.30	0.00	0.28	0.00	0.00	0.00	0.00	0.23	0.00	0.00	97.03
rawdon	sed	1004=1	rut	1.71	95.09	0.00	1.33	0.00	0.79	0.00	0.00	0.00	0.00	0.00	98.92
rawdon	sed	1004=2	rut	0.19	99.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.03
rawdon	sed	1005=1	rut	0.00	99.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.52
rawdon	sed	1005=2	rut	0.29	100.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.68
rawdon	sed	1005=3	rut	0.21	100.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.22
rawdon	sed	1005=4	rut	0.16	96.92	0.00	1.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98.82
rawdon	sed	1009=1	rut	0.24	98.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.16
rawdon	sed	1009=2	rut	0.16	100.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.61
rawdon	sed	1009=3	rut	0.43	98.25	0.12	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.11
rawdon	sed	1009=4	rut	0.37	97.42	1.22	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.61
rawdon	sed	1012=1	rut	0.18	98.19	0.12	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.47

Table 10. Electron microprobe chemical analyses of Fe-Ti oxides from potential source areas (cont'd).

rawdon	sed	1012=2	rut	3.69	96.01	0.37	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.40
rawdon	sed	1012=3	rut	0.27	99.02	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.71
rawdon	sed	1012=4	rut	2.30	95.18	1.68	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.55
rawdon	sed	1012=5	rut	3.07	96.57	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.34
rawdon	sed	1016=1	rut	0.25	98.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.02
rawdon	sed	1016=2	rut	0.22	99.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.73
rawdon	sed	1016=3	rut	0.28	98.92	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.54
rawdon	sed	1017=1	rut	0.39	98.75	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.37
rawdon	sed	1017=2	rut	0.34	99.68	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.40
rawdon	sed	1017=3	rut	0.39	99.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.63
rawdon	sed	1017=4	rut	0.55	96.38	0.12	1.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98.89
rawdon	sed	1019=1	rut	0.21	99.43	0.21	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.07
rawdon	sed	1020=1	rut	0.24	99.93	0.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	101.12
rawdon	sed	1020=2	rut	0.37	98.58	0.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.77
rawdon	sed	1022=1	rut	0.43	98.75	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.06
rawdon	sed	1022=2	rut	0.65	97.51	0.00	0.90	0.00	0.00	0.13	0.00	0.00	0.00	0.00	99.54
rawdon	sed	1023=1	rut	0.22	99.84	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.34
rawdon	sed	1023=2	rut	0.24	99.11	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.61
rawdon	sed	1030=1	rut	0.20	99.61	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.13
rawdon	sed	1030=2	rut	0.15	100.89	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	101.26
rawdon	sed	1030=3	rut	0.17	98.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98.90
rawdon	sed	1030=4	rut	0.18	99.85	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.26
rawdon	sed	1030=5	rut	0.15	99.59	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.97
rawdon	sed	1037=1	rut	0.32	98.66	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.35
rawdon	sed	1037=2	rut	0.15	98.52	0.00	1.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.86
rawdon	sed	1046=1	rut	0.29	93.88	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	94.72
rawdon	sed	1046=2	rut	1.00	93.78	0.68	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	95.97
rawdon	sed	1052=1	rut	0.00	98.74	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.57
rawdon	sed	1052=2	rut	0.28	98.93	0.13	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.58
froglake	dthb	2996=1	mgt	0.00	0.20	0.43	92.27	0.20	0.03	0.03		0.34	0.00	0.00	93.67
froglake	dthb	2996=2	ilm	0.00	45.59	0.10	51.87	1.78	0.07	0.05		0.22	0.00	0.00	99.83
froglake	dthb	2996=3	mgt	0.00	0.40	0.14	91.59	0.21	0.01	0.08		0.78	0.00	0.00	93.38
froglake	dthb	3138=1	mgt	0.00	0.19	0.24	91.83	0.16	0.00	0.05	0.00	0.25	0.00	0.00	92.89
froglake	dthb	3138=2	ilm	0.00	49.16	0.03	47.92	1.49	0.02	0.03	0.00	0.19	0.00	0.00	98.98
froglake	dthb	3138=3	ilm	0.00	42.62	0.06	53.50	1.48	0.04	0.03	0.00	0.17	0.00	0.00	98.05
froglake	dthb	3138=4	mgt	0.03	3.62	0.08	90.89	0.15	0.00	0.03	0.00	0.15	0.00	0.00	94.95
froglake	dthb	3138=5	mgt	0.00	3.01	0.16	89.69	0.18	0.01	0.05	0.00	0.26	0.00	0.00	93.53
froglake	dthb	3138=6	mgt	0.00	0.25	0.09	90.94	0.17	0.02	0.32	0.00	0.19	0.00	0.00	92.15
froglke	hitidt	2969=1	mgt	0.00	0.14	0.17	92.80	0.20	0.00	0.04	0.00	0.25	0.00	0.00	93.77
froglake	hitidt	2969=2	mgt	0.00	45.70	0.07	48.24	3.63	0.05	0.03	0.00	0.18	0.00	0.00	98.04
froglake	hitidt	2969=3	mgt	0.00	0.35	0.17	91.93	0.18	0.00	0.05	0.00	0.27	0.00	0.00	93.12
froglake	hitidt	2969=4	ilm	0.00	48.80	0.07	48.06	3.76	0.08	0.01	0.00	0.18	0.00	0.00	99.10
froglake	hitidt	3150=1	mgt	0.04	0.07	0.09	93.31	0.01	0.03	0.00	0.00	0.13	0.00	0.00	93.68
froglake	hitidt	3150=2	ilm	0.04	48.90	0.04	44.06	4.42	0.07	0.25	0.00	0.00	0.00	0.00	97.78
froglake	hitidt	3150=3	mgt	0.06	0.08	0.08	92.81	0.02	0.03	0.12	0.00	0.10	0.00	0.00	93.20
froglake	hitidt	3150=4	ilm	0.00	49.72	0.01	47.63	2.29	0.06	0.03	0.00	0.05	0.00	0.00	99.79
froglake	hitidt	3150=5	mgt	0.00	0.71	0.08	92.69	0.09	0.02	0.09	0.00	0.10	0.00	0.00	93.78
froglake	hitidt	3150=6	ilm	0.00	48.69	0.05	44.78	4.09	0.08	0.06	0.00	0.00	0.00	0.00	97.75
froglake	hitidt	3150=7	ilm	0.05	49.43	0.04	45.82	3.60	0.08	0.07	0.00	0.02	0.00	0.00	99.11
froglake	hitidt	3150=8	ilm	0.01	49.25	0.00	45.90	3.86	0.06	0.16	0.00	0.01	0.00	0.00	99.24
froglake	hitidt	2946=1	ilm	0.15	51.91	0.05	42.03	4.36	0.04	0.34	0.00	0.03	0.00	0.00	98.91
froglake	pxmidt	2947=1	ilm	0.15	51.91	0.03	44.44	3.38	0.06	0.06	0.00	0.00	0.00	0.00	97.95
froglke	pxmidt	2947=1	ilm	0.04	48.58	0.02	43.49	3.53	0.06	0.23	0.00	0.00	0.00	0.00	95.94
froglake	pgdthb	2653=1	ilm	0.00	48.37	0.05	45.92	3.71	0.10	0/07	0.00	0.35	0.00	0.00	98.71
froglake	gr	3119=1	mgt	0.06	0.03	0.11	93.52	0.00	0.04	0.00	0.00	0.09	0.00	0.00	93.85

Table 10. Electron microprobe chemical analyses of Fe-Ti oxides from potential source areas (cont'd).

wentw	mgdt	5055=1	he	1.72	0.67	0.76	85.43	0.00	0.52	0.32	0.17	0.00	0.00	0.00	89.58
wentw	ga	5061=1	ilm	0.00	49.23	0.00	45.06		1.49	0.00	0.00	0.00	0.00	0.00	95.79
wentw	ga	5061=2	he	0.00	2.64	0.57	85.18	0.00	0.00	0.00	0.00	0.38	0.00	0.00	88.78
wentw	ga	5061=3	he	0.37	2.49	0.22	86.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	89.48
wentw	ga	5061=4	he	0.22	2.18	0.00	85.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.21
sheldy	di	md018=1	ilm	0.00	50.09	0.00	48.16	0.47	0.45	0.00	0.00	0.00	0.00	0.00	99.17
sheldy	di	md018=2	mgt	0.26	17.90	1.14	74.94	0.59	0.35	0.00	0.00	0.00	0.00	0.00	95.76
sheldy	di	md018=3	ilm	0.00	50.15	0.00	48.68	0.43	0.57	0.00	0.00	0.00	0.00	0.00	99.83
sheldy	di	md024=1	mgt	0.25	16.87	0.73	75.59	0.64	0.00	0.00	0.00	0.00	0.00	0.00	94.71
sheldy	di	md024=2	ilm	0.00	50.79	0.00	47.08	1.52	0.00	0.00	0.00	0.00	0.00	0.00	99.72
sheldy	di	md024=3	mgt	0.21	15.16	1.42	77.77	0.43	0.00	0.00	0.00	0.00	0.00	0.00	95.49
sheldy	di	md024=4	ilm	0.00	49.46	0.00	48.15	1.04	0.00	0.00	0.00	0.00	0.00	0.00	98.65
sheldy	di	md024=5	mgt	0.28	14.11	1.37	78.19	0.34	0.27	0.00	0.00	0.00	0.00	0.00	95.03
sheldy	di	md024=6	ilm	0.00	49.85	0.00	48.42	0.81	0.46	0.00	0.00	0.00	0.00	0.00	99.87
sheldy	di	md032=1	mgt	0.00	14.76	0.96	78.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	95.14
sheldy	di	md032=2	ilm	0.00	49.19	0.00	49.16	0.49	0.00	0.00	0.00	0.00	0.00	0.00	98.84
sheldy	di	md032=3	mgt	0.28	14.35	1.02	77.38	0.66	0.00	0.00	0.00	0.00	0.00	0.00	94.09
sheldy	di	md032=4	ilm	0.20	49.62	0.00	48.80	0.45	0.00	0.00	0.00	0.00	0.00	0.00	99.37
sheldy	di	md032=5	mgt	0.44	13.28	1.67	77.63	0.74	0.00	0.00	0.00	0.00	0.00	0.00	94.14
sheldy	di	md032=6	ilm	0.00	50.20	0.00	47.54	0.76	0.83	0.00	0.00	0.00	0.00	0.00	99.33
sheldy	di	md014=1	ilm	0.21	49.49	0.00	48.16	0.96	0.43	0.00	0.00	0.00	0.00	0.00	99.56
sheldy	di	mdo14=2	ilm	0.00	49.85	0.00	47.91	0.95	0.31	0.00	0.00	0.00	0.00	0.00	99.01
sheldy	di	mdo14=3	ilm	0.22	42.66	0.26	54.58	0.64	0.41	0.00	0.00	0.00	0.00	0.00	99.09
sheldy	di	mdo14=4	ilm	0.00	49.65	0.00	48.43	1.03	0.27	0.00	0.00	0.00	0.00	0.00	99.38
sheldy	di	mdo14=5	ilm	0.32	49.68	0.00	47.42	1.22	0.22	0.00	0.00	0.00	0.00	0.00	99.15
sheldy	di	mdo14=6	ilm	0.21	49.98	0.00	48.55	0.77	0.31	0.00	0.00	0.00	0.00	0.00	99.82
sheldy	di	mdo14=7	ilm	0.00	49.42	0.00	47.88	1.08	0.27	0.00	0.00	0.00	0.00	0.00	98.99
sheldy	di	mdo14=8	ilm	0.00	48.75	0.00	47.89	1.11	0.00	0.00	0.00	0.00	0.00	0.00	97.76
sheldy	di	mdo38=1	ilm	0.00	49.35	0.00	48.20	0.93	0.27	0.00	0.00	0.00	0.00	0.00	99.06
sheldy	di	mdo38=2	ilm	0.39	49.89	0.00	47.94	0.67	0.38	0.00	0.00	0.00	0.00	0.00	99.26
sheldy	di	mdo38=3	ilm	0.00	50.26	0.00	48.44	0.52	0.50	0.00	0.00	0.00	0.00	0.00	99.72
sheldy	di	md038=4	ilm	0.00	49.73	0.00	48.77	0.50	0.52	0.00	0.00	0.00	0.00	0.00	99.94
sheldy	di	md038=5	mgt	2.16	16.05	0.95	71.38	0.99	0.00	1.88	0.00	0.00	0.00	0.00	94.01
sheldy	di	md018=1	mgt	2.41	18.24	1.61	68.80	0.74	0.35	2.27	0.00	0.00	0.00	0.00	94.83
sheldy	di	md018=2	mgt	0.63	16.22	0.94	74.92	0.38	0.00	0.00	0.00	0.00	0.00	0.00	93.51
nmb	ba	9919a=1	ilm	0.17	49.78	0.00	44.78	0.30	1.20	0.00	0.00	0.00	0.00	0.00	97.61
nmb	ba	9905=1	ilm	0.24	50.05	0.03	45.55	0.44	1.22	0.00	0.00	0.00	0.00	0.00	96.67
nmb	ba	9905a=2	mgt	0.70	14.37	1.22	74.02	0.37	0.70	0.00	0.00	0.00	0.00	0.00	91.63
nmb	ba	9905a=3	ilm	0.29	48.23	0.13	45.75	0.64	1.29	0.00	0.00	0.00	0.00	0.00	96.99
nmb	ba	9905a=4	ilm	0.19	49.26	0.14	46.02	0.26	1.70	0.00	0.00	0.00	0.00	0.00	99.34
nmb	ba	9905a=5	he	0.22	6.56	5.52	75.92	0.09	0.65	0.00	0.00	0.00	0.00	0.00	89.91
nmb	ba	9915=1	mgt	2.82	22.50	2.23	64.27	0.67	0.11	0.00	0.00	0.00	0.00	0.00	93.01
nmb	ba	9915=2	mgt	1.82	21.67	1.60	65.01	0.80	0.00	0.00	0.00	0.00	0.00	0.00	91.21
nmb	ba	9931b=1	he	0.46	10.50	0.92	77.74	0.95	0.05	0.00	0.00	0.00	0.00	0.00	91.46
nmb	ba	9926=1	ilm	0.19	49.11	0.08	48.19	0.30	1.32	0.00	0.00	0.00	0.00	0.00	99.07
nmb	ba	9926=2	mgt	0.28	10.18	1.20	80.97	0.16	0.49	0.00	0.00	0.00	0.00	0.00	93.26
nmb	ba	9912=1	mgt	0.29	26.11	1.66	62.05	0.30	0.30	0.00	0.00	0.00	0.00	0.00	90.73
nmb	ba	9926=3	ilm	0.23	48.76	0.02	47.37	0.48	0.95	0.00	0.00	0.00	0.00	0.00	98.45
nmb	ba	9926=4	ilm	0.38	48.54	0.03	47.06	0.29	0.96	0.00	0.00	0.00	0.00	0.00	97.60
nmb	ba	9926=5	ilm	0.18	48.22	0.06	48.06	0.54	0.76	0.00	0.00	0.00	0.00	0.00	99.43
nmb	ba	9926=6	mgt	0.20	7.48	0.89	81.80	0.15	0.18	0.00	0.00	0.00	0.00	0.00	91.02
nmb	ba	9938=1	mgt	4.00	21.03	3.24	62.07	0.74	0.54	0.00	0.00	0.00	0.00	0.00	91.73
nmb	ba	9920a=1	mgt	0.65	16.57	2.28	73.16	0.23	0.65	0.00	0.00	0.00	0.00	0.00	93.70
nmb	ba	9920a=2	mgt	0.66	26.06	1.59	64.43	0.24	0.64	0.00	0.00	0.00	0.00	0.00	93.79
beabank	quz	9502=1	ilm	0.39	52.19	0.00	30.23	15.07	0.00	0.00	0.00	0.00	0.00	0.00	97.88

Table 10. Electron microprobe chemical analyses of Fe-Ti oxides from potential source areas (cont'd).

beabank	quz	9502=2	ilm	0.36	52.91	0.00	29.25	15.94	0.00	0.00	0.00	0.00	0.00	0.00	98.46
beabank	quz	9502=3	ilm	0.19	52.89	0.00	30.66	15.27	0.00	0.00	0.00	0.00	0.00	0.00	99.29
beabank	slt	9505=1	ilm	0.24	53.30	0.00	32.43	13.96	0.00	0.00	0.00	0.00	0.00	0.00	99.93
beabank	slt	9515=1	ilm	0.21	52.01	0.00	30.71	15.33	0.00	0.00	0.00	0.00	0.00	0.00	98.26
beabank	slt	9501=1	ilm	3.94	50.40	0.22	26.54	18.39	0.00	0.23	0.00	0.00	0.00	0.00	99.72
beabank	slt	9507=1	ilm	0.20	53.06	0.00	37.77	9.15	0.00	0.00	0.00	0.00	0.00	0.00	100.18
beabank	slt	9507=2	ilm	0.45	53.60	0.00	28.19	16.50	0.00	0.11	0.00	0.00	0.00	0.00	98.85

Key to localities

bap=Barrington Passage tonalite, Nova Scotia (this study).
wdp= Wedgeport monzogranite, Nova Scotia (this study).
C20, C21= Offshore granite cores, south west Nova Scotia (Pe-Piper and Loncarevic, 1989).
moh= Mohawk B-93 well, Palaeozoic granites (this study).
jae= Jaeger A-49 well, Palaeozoic granites (this study).
oji= Ojibwa E-07 well, Palaeozoic granites (this study).
newcorn= New Cornwall syenogranite, Nova Scotia (Pe-Piper and Ingram, 2002).
cobprec= Neoproterozoic plutonic rocks of eastern Cobequid Highlands, Nova Scotia (Pe-Piper et al., 2002)
wentw= Wentworth plutonic complex, Nova Scotia (this study).
dbfm= Fountain Lake basalt, Nova Scotia (this study).
fl= Fountain Lake basalt (this study).
mrgr= West Moose River pluton granite, Nova Scotia (this study).
cabdyke= carboniferous rhyolitic dykes, Cobequid Highlands, Nova Scotia (this study).
php= Pleasant Hills pluton granites, Nova Scotia (this study).
mr= Newfoundland anorthosites (Pe-Piper and Dessureau, 2002).
bassr= Bass River magnetite deposit (Bond, 1999).
germt= Gerrish Mountain deposit (Bond, 1999).
rawdon= Meguma Group metasediments (Haysom, 1994).
froglake= Frog Lake pluton, Nova Scotia (this study).
wentw= Wentworth plutonic complex (Hilton, 1998).
sheldy=Shelbourn dyke (Durning, 1995).
nmb= North Mountain Basalt (De Wolfe, 2001).
beabank= Meguma Group metasediments (Feetham, 1996).

Table 11. Whole rock chemical analyses of the sand fraction and the clay fraction from representative sand and clay rocks (data from Stea *et al.*, 1996).

Borehole	Depth (m)	File Number	Lith-ology[2]	SiO_2	TiO_2	Al_2O_3	Fe_2O_{3t}	MnO	MgO	CaO	Na_2O	K_2O	L.O.I	Total
SHU 94-2	95.0 - 100.0	132	sand	97.45	0.17	0.17	0.54	0.00	0.03	0.10	0.05	0.12	n.d	98.63
SHU 95-1	39.4	133	sand	95.17	0.27	3.29	0.73	0.00	0.11	0.26	0.18	0.28	n.d	100.29
SHU 95-2	40.9	134	sand	92.24	0.14	2.65	1.19	0.00	0.26	1.71	0.40	0.50	n.d	99.09
SHU 95-3	44.4	135	sand	98.17	0.14	1.55	0.54	0.00	0.05	0.26	0.06	0.09	n.d	100.86
SHU 95-4	45.4	136	sand	97.71	0.08	1.15	0.57	0.00	0.08	0.18	0.14	0.19	n.d	100.10
SHU 95-5	46.9	137	sand	96.98	0.06	1.01	0.59	0.00	0.06	0.17	0.10	0.17	n.d	99.14
SHU 95-6	49.9	138	sand	96.61	0.39	2.45	0.78	0.00	0.08	0.11	0.19	0.28	n.d	100.89
SHU 95-7	52.9	139	sand	98.22	0.14	1.06	0.40	0.00	0.02	0.07	0.06	0.07	n.d	100.04
SHU 95-8	55.3	140	sand	97.38	0.13	1.00	0.65	0.00	0.10	0.19	0.12	0.21	n.d	99.78
SHU 95-9	64.9	141	sand	96.12	0.02	0.87	1.56	0.00	0.00	0.04	0.03	0.03	n.d	98.67
SHU 94-4-01		142	clay	46.86	1.35	36.20	1.28	0.00	0.19	0.02	1.08	1.75	11.50	100.23
SHU 95-5-15		143	clay	46.23	0.93	37.36	1.38	0.00	0.16	0.05	0.82	1.44	12.20	100.57
SHU 95-5-16		144	clay	50.89	0.84	25.88	4.76	0.00	1.98	0.66	0.80	5.99	6.70	98.50
SHU 95-5-17		145	clay	51.60	0.80	24.87	5.74	0.00	3.60	0.25	0.77	6.52	6.20	100.35
MUSC 95-1-01		146	clay	52.48	0.97	27.63	3.01	0.00	1.53	0.03	0.62	7.07	5.90	99.24
MUSC 95-2-01		147	clay	43.75	1.59	33.46	8.29	0.00	0.08	0.29	0.55	1.13	10.90	100.04
MUSC 95-3-01		148	clay	50.78	0.91	28.70	3.50	0.00	1.85	0.29	0.80	7.21	6.20	100.24
MUSC 95-4-16		149	clay	45.19	1.15	36.04	4.29	0.00	0.10	0.02	0.67	1.30	11.60	100.36
MUSC 95-4-17		150	clay	44.89	1.10	37.70	1.18	0.00	0.11	0.04	0.51	1.18	12.80	99.51
MUSC 95-4-19		151	clay	46.32	0.73	38.75	0.70	0.00	0.08	0.03	1.05	1.95	11.10	100.71
MUSC 95-4-20		152	clay	45.95	1.35	38.35	0.80	0.00	0.16	0.11	0.56	0.70	12.50	100.48
MUSC 95-4-21		153	clay	45.76	1.27	38.92	0.72	0.00	0.03	0.03	0.63	0.33	13.20	100.89
MUSC 95-4-22		154	clay	38.65	1.19	34.26	1.89	0.00	0.51	0.03	0.91	1.31	21.50	100.25
MUSC 95-4-23		155	clay	46.75	1.41	35.87	1.05	0.00	0.13	0.03	0.55	0.67	12.30	98.76
MUSC 95-4-25		156	clay	45.29	1.16	25.52	1.74	0.00	1.03	0.03	0.38	4.25	21.40	100.80
MUSC 95-4-26		157	clay	48.89	0.86	26.47	2.97	0.00	0.98	0.07	0.62	6.70	12.20	99.76
MUSC 95-4-27		158	clay	44.72	0.14	37.19	0.70	0.00	0.11	0.11	0.70	1.20	15.60	100.47

n.d. = no data

[2]sand = 2mm - 0.063mm size fraction of silica sand samples

[2]clay = <2μm size fraction of mudstone samples